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# Survey of Newsprint Industry Completed

## Dominion Securities Corporation Makes Public Survey of Present Conditions and Long-Term Outlook In Newsprint Industry—Decline of Canadian Dollar in Terms of U. S. Currency Introduces Important Change.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., November 13, 1939—An interesting survey of the newsprint industry in Canada having regard to hostile conditions has just been made public by the Dominion Securities Corporation. The survey deals not only with present conditions but also with the long-term outlook. Note is made of the fact that at the outbreak of hostilities paper stocks replaced gold mining securities as the favorites on the Stock Exchange, the Montreal Stock Exchange Paper Index jumping from 54 to 108 in the first four days following September 1st. The opinion is expressed, however, that perhaps too much emphasis has been placed on the effect of hostilities on European shipments to the United States and not enough on the influence of the disruption of navigation on Canadian newsprint shipments overseas, for whereas European shipments to the United States might have reached 325,000 tons in 1939, Canadian overseas shipments would have amounted to 450,000 tons. However, the view is expressed that "if the Canadian exporter can find the means of transportation, he has a wonderful opportunity to seize markets, particularly in South America which was formerly closed to him through a $7.00 per ton price differential."

On the other hand, it is pointed out that England's newsprint consumption has been cut about 50 per cent and mills formerly supplying that country—such as those in Newfoundland—will offer more competition in markets in the Americas. The net result, says the survey, presuming the present naval status quo is maintained, will doubtless be in Canada's favor and these factors alone might increase Canada's 1940 newsprint production at least 5 per cent over 1938.

### $4 Per Ton Exchange Premium

Perhaps the most important single change introduced into the Canadian newsprint economy, however, has been the decline of the Canadian dollar in terms of United States currency. For instance, if the Canadian manufacturers ship 2,600,000 tons to the United States in 1940, they may easily receive $10,000,000 in premiums at no additional cost to the publishers of that country. This will in effect increase the price of newsprint about $4 a ton, and some companies will find that this bonus will comfortably cover the interest on their bonded indebtedness. The survey proceeds:

"The gratuity is most welcome as it helps the Canadian manufacturer defray advancing costs and enables him to maintain the present price level to the United States consumer. In passing, it might be germane to mention that no better method could be adopted to obtain true good-will from the United States publishers than to retain the present price level as long as it is economically feasible."

### Canadian To Continue $50 Ton Price

The fact that the industry has announced the continuation of the $50 price for the first quarter of 1940 is held to speak volumes for the co-operation and farsightedness of the present Canadian manufacturers, "and may forecast a long-needed change in producer-consumer relationship."

### Trends of Consumption

The difficulties of getting really reliable information regarding monthly trends of national newspaper circulation in the United States are discussed, but an estimate is made that if the present upward trend holds it may add between 300,000 and 400,000 tons to the total United States consumption above that of 1938, and Canada should obtain at least 70 per cent of this, or perhaps 275,000 tons. The net effect would be to raise United States consumption to near record heights, but Canadian production in 1940, presuming the present level of stocks is continued, will still very likely be below the peak year of 1937 when publishers artificially increased their holdings in anticipation of the 1938 price advance.

### Premium May Bring High Prosperity

If the present 10 per cent premium is maintained quite possibly the financial prosperity of the industry will be well above the 1937 levels, especially as a higher rate of production should effect a saving in operating costs. On the whole the outlook for the industry is therefore "very promising."

### The Long-Term Outlook

As to the long-term outlook, consideration is given

*(Continued on page 24)*

# Building of Wolf Reservoir May Start Soon

## Preliminary Work Now Progressing For Large Storage Reservoir To Benefit Fox River Paper Mills—Brief Filed By Mills Opposing Freight Rate Increase—Paper Men To Address Manufacturers—Late Mill News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., November 13, 1939—Exploratory drillings are being made at the site near Lily, Wis., where the vast storage reservoir is to be built on the Wolf River for the benefit of Fox River Valley paper mills, indicating that early construction will be undertaken. Harry Brooks, secretary of the Wolf River Reservoir Company, said the tests were being made to determine the best location for the dam so work can be started this fall. The company hopes to have the reservoir completed in time to catch flood waters next spring, and give mills and other water power users relief for the first time next summer when low water stages usually affect or curtail operations.

There are still numerous negotiations to be carried through before construction can start. The plans must be approved by the Wisconsin Public Service Commission, in accordance with provisions of the charter granted by the State Legislature. Permission also must be obtained from the Federal Power Commission to erect the dam, and possibly from the War Department. It is believed the latter will quickly approve the project because the waters fed from the Wolf River will aid navigation on the Fox River, principally embodying barging of coal to paper mills.

### Mills Oppose Freight Rate Increase

With arguments completed before the Interstate Commerce Commission at Washington opposing proposed freight rate increases on paper and paper products shipped from Wisconsin to the southwestern part of the United States, Wisconsin mills are awaiting the commission's decision. The Wisconsin Public Service Commission appeared on behalf of the paper manufacturers and also filed a long brief opposing the increase on the ground that such action would threaten one of the state's greatest industries and many communities almost entirely dependent upon that industry.

It was pointed out by P. H. Porter, counsel for the state commission, that the center of production is no longer in Wisconsin. Value of paper and paperboard products dropped from 90 million to 72 million dollars in Wisconsin from 1927 to 1935. During the same period the value of similar articles increased from 17 million to 27 million dollars in a group of southern and southwestern states. From 1929 to 1935, Wisconsin's production dropped nearly 100,000 tons while Louisiana's increased 176,000 tons. Southern states have great advantages in lower material costs, Mr. Porter said. Northern mills must go farther afield for their wood and many times find it cheaper to purchase pulp manufactured in Scandinavian countries and ship it to Wisconsin than to produce pulp locally.

### Pulpwood Stands To Become Game Refuge

A tract of 3,640 acres of land in Wood County owned by the Nekoosa-Edwards Paper Company, Port Edwards, Wis., has been set aside by the Wisconsin Conservation Commission as a game refuge. It embodies largely the territory where the company-owned reforestation project is carried on. The order takes effect November 18 and runs for a period of five years. This procedure will eliminate hunting and trapping within the area, and will promote propagation of wild life.

### Thilmany Reports Good Safety Record

The "lower" mill of the Thilmany Pulp and Paper Company, Kaukauna, Wis., has completed its 100th consecutive day without a lost-time accident, and when that objective was reached the mill whistle was blown for a minute. The upper and lower mills are engaged in a safety contest, and during a period of four months each has only one lost-time accident against its record, according to L. C. Smith, personnel director. Monthly prizes were won by Arthur Roberts and Alex Wolf.

### Paper Men To Address Manufacturers

Two paper mill executives are among the speakers scheduled for the annual meeting of the Wisconsin Manufacturers Association at Pfister Hotel, Milwaukee, Friday, December 1. They are S. F. Shattuck, vice-president of the Kimberly-Clark Corporation, Neenah, and Joseph M. Conway, president of Hoberg Paper Mills, Inc., Green Bay. Among matters to be discussed will be corporate financial reports for employees, labor problems, working conditions for labor and retaining employee good will, apprentice training, health insurance developments, war orders, unemployment compensation, taxation, and means for industry to sell itself to the community. The speaker at the annual banquet will be Raymond Moley, former "Braintruster No. 1" for the administration. His subject will be "Our Place in World Affairs in the Light of War's Upheaval."

### Paper Mill Unions To Meet December 10

Hundreds of delegates from paper mills in Wisconsin, Michigan and Minnesota will meet at Kaukauna, Wis., Sunday, December 10. It will be a meeting of the Tri-State Council of Paper Workers' Unions. John P. Burke, president of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, has been invited to speak.

### Fred Huband Estate Appraised at $60,000

The estate of Fred Huband of Menasha, Wis., who was superintendent and a director of the Gilbert Paper Company for many years, is appraised at approximately $60,000, according to the will filed in probate court of Winnebago County. Since there were no survivors in his immediate family, the principal beneficiary is his housekeeper, Mrs. Minnie Reich.

### Daughter of D. C. Everest Married

A marriage of interest that took place November 3 is that of Mrs. Ruth Gritzmacher of Wausau, Wis., to Norman E. Weaver of Stevens Point, Wis. The

bride's father is D. C. Everest, president and general manager of the Marathon Paper Mills Company. The wedding took place at the Everest home, with a reception afterwards at the Wausau Club. The couple will reside at Stevens Point.

### Paper Man Noted As Collector

Charles W. Hamilton, president and treasurer of the Milwaukee Lace Paper Company, Milwaukee, Wis., received feature publicity in The Milwaukee Journal recently because of his hobby. It is revealed that he is a collector of the small statuary of John Rogers, who was once known as the sculptor of the American people. The hobby was started seven or eight years ago when Mr. Hamilton discovered one of the pieces entitled "Neighboring Pews" in an abandoned factory building at Buena Vista, Va. Today he has enough statues to fill his office, and then some.

### Appleton Paper Adds to Engine Room

Appleton Coated Paper Company is constructing an addition to its engine room, the cost of which is estimated at $6,000. It is 25 by 12½ feet, 15 feet high, and will be of concrete and brick. Koepke Construction Company of Appleton, has the contract. According to Charles S. Boyd, president, an auxiliary engine will be installed to provide an increase in power at the plant.

## British Columbia Mills Active

VANCOUVER, B. C., November 10, 1939—British Columbia's pulp and paper industry is starting to hum faster and faster. With Pacific Mills, Ltd., at Ocean Falls and the Powell River Company at Powell River both on a six day week basis now the newsprint production volume of the province is at its highest total for months. The five day week schedule has been in effect at both these big plants since last spring.

Probably the most interesting development of the past week in B. C., as far as the newsprint industry is concerned, is the return of Japan as a large scale active buyer in this market. The B. C. Pulp and Paper has orders on hand from Japan for about 3500 tons of bleached sulphite pulp on which the market runs about $50 per ton. It will be delivered during November and December. This company is also shipping pulp to England, the Continent, South America, Mexico and the United States.

Both the Port Alice and the Woodfibre plants of the B. C. Pulp and Paper Company are now working to capacity. Approximately 400 men are employed in the mills at each plant, with another 200 in logging camps at Port Alice and about 75 in contractors' logging camps at Woodfibre.

In the kraft wrapping paper field Pacific Mills, Ltd., have also experienced a heavy increase in demand and a big gain in price, although not so large as the jump reported in eastern quotations. Westminster Paper Mills, New Westminster are also working to capacity.

## C. B. Nyman Joins Swenson Co.

C. B. Nyman has joined the staff of the Swenson Evaporator Company. This concern manufactures evaporators, soda and sulphate pulp mill machinery, rotary vacuum filters and continuous causticizing and pulp washing systems at Harvey, Ill.

## Whittemore Leaves Certain-Teed

Audenried Whittemore, who in twenty-nine years with Certain-teed Products Corporation and its predecessor company worked his way up through the ranks to become executive vice-president, last week announced that he had resigned his position and severed all connections with the company, including the presidency of its subsidiaries, the Beaver Company Ltd., and the Beaver Wood Fibre Company Ltd., both of Ontario.

"When I joined General Roofing Manufacturing Company in East St. Louis, Ill., in 1910 we had three roofing plants and two of those three had been but recently acquired," Mr. Whittemore said.

"Today Certain-teed has twenty-four plants and mills which manufacture roofing of all types, plaster, plaster board and laths, fibre boards, box boards and newsprint.

"Total sales the first year I was with the company were approximately $2,000,000 as contrasted to about $17,000,000 for Certain-teed last year. There were approximately 300 employees when I was hired as the company's first engineer. Today between 2,500 and 3,000 persons are on the payroll.

"From a small mid-western company it has grown into a concern which ranks among the leaders in the nation's building material supply field."

After one year as mechanical engineer Mr. Whittemore became manager of the company's East St. Louis plant and then took over the same position at the Marseilles, Ill. plant. In 1914 he was sent to Chicago as district sales manager and in 1917 moved back to the St. Louis headquarters as vice-president in charge of sales. It was in 1917 that Certain-teed was organized.

From 1921 to 1936 he was senior vice-president, moving to New York when the general offices were brought here. After a year as vice-president in charge of manufacture he was named executive vice-president in 1938.

## October Newsprint Statistics

Production of newsprint in Canada during October 1939 amounted to 280,985 tons and shipments to 289,260 tons, according to the News Print Service Bureau. Production in the United States was 78,591 tons and shipments 79,364 tons, making a total United States and Canadian newsprint production of 359,576 tons and shipments of 368,624 tons. During October, 29,450 tons of newsprint were made in Newfoundland, so that the total North American production for the month amounted to 389,026 tons. Total production in October 1938 was 351,605 tons.

The Canadian mills produced 170,352 tons more in the first ten months of 1939 than in the first ten months of 1938, which was an increase of seven and nine tenths per cent. The output in the United States was 116,910 tons or seventeen and six tenths per cent more than in the first ten months of 1938, in Newfoundland 39,364 tons or eighteen and six tenths per cent more, making a total increase of 326,626 tons, or ten and seven tenths per cent.

Stocks of newsprint paper at the end of October were 192,609 tons at Canadian mills and 15,923 tons at United States mills, making a combined total of 208,532 tons compared with 217,580 tons on September 30, 1939.

# Chicago Market Stable Under Heavy Demand

## Tone of Midwest Paper Trade More Normal With Dealers Reporting Business Nearly On A Rational Sales Basis — Orders For Most Grades of Paper Continue Large and Paper Stock Market Continues Strong.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., November 13, 1939—The local paper market has now assumed a comparatively stable position with demand running fairly heavy and the general tone of the market having calmed down to a persistent seasonal sales program. Mills as represented in Chicago are reported to be "catching up" as paper executives wonder "how far" the current business boom will proceed and attempt to analyze just how much of the betterment is "boom" and how much "psychological". Most of those interviewed feel the two to be interrelated and that hostilities in Europe has helped to get our minds off our own domestic troubles such as debt and labor troubles —at least for the time being. Specifically, bonds and ledgers form a steady group with good demand and fairly large orders. Groundwoods are in good shape as are newsprints. Krafts, generally, are in good demand while books and covers have shown a tendency to improve their strength from week to week. The board market is said to be better while the specialty groups are finding retail buying exceptionally good this Fall. Waste papers continue to be strong.

### Local Association Temporarily Cease Program

It is reported among local paper circles that the Chicago Paper Association, long known as the "coarse paper" group which included membership representing about 25 wrapping paper merchants, has decided to temporarily cease functioning. If this is the case it will call a halt, even if temporarily, to some exceptionally worthwhile activities which have been directed by men well and favorably known in the paper industry although it is said that such activities will be carried on either by the individual concerns or through affiliate groups.

### J. Chukerman & Sons Move

J. Chukerman & Sons are scheduled to move into new headquarters at 917 West Lake Street, about December 1. The new quarters to be occupied by the well known coarse paper firm, are located in a building containing over 50,000 square feet of floor space, a three story structure with good shipping facilities. Offices and general headquarters will be moved to the new Lake Street location from 2440 W. Lake Street according to William Chukerman who indicated that the larger quarters would provide more opportunity to service a rapidly expanding business.

### Discuss Paper Box Standardization

Standardization of the sizes of boxes and bags used in the wrapping of customer purchases would mean a saving to retail merchants of as much as $25,000,000 a year according to the National Retail Dry Goods Association which is urging Chicago stores to give active support to a proposed standardization project as one of the most direct and a simple avenue of economy in the retail field. Elmer French, Boston Store of Chicago, is head of the association committee studying the possibilities of the idea. He has estimated that full support of the proposal would bring down supply expense in relation to sales of the average store at least ¼ to ½ per cent and a reduction of the supply expense itself of 12 to 25 per cent. Large orders on a standard item would enable manufacturers to run a large supply in a standard classification and carry reserve stock instead of being compelled to produce boxes and bags to meet varying specifications of each order. The Committee is said to have suggested 75 sizes in set-up boxes, 63 in corrugated boxes, 23 in folding type and 22 in paper bags as sufficient to cover all needs of the average department or specialty store.

### Health Board Approves Paper Containers

The Chicago Board of Health this week gave a qualified approval to paper milk bottles and specifically ordered the drawing up of ordinances to permit their use. It now begins to look as though enough public sentiment was being created in Chicago to force a "show down" on the reticence of the city counsel to take immediate action on the matter and the local press is carrying many references to the subject.

### House Organ Analyzes Customer Accounts

The current issue of the Informant, house organ published by the Midland Paper Company division of Zellerbach, makes its appearance this week. In it is an analyzation of the value of customer accounts and of the way in which the printer can sell such an idea to paper buyers. Also the current Glossary of Trade Terms and some interesting facts about paper sandwiched in with the advertisements and copy of several associates of Zellerbach.

### Swigart Issues Price Changes

The Swigart Paper Company this week issued price list changes on Book, Bonds, Mimeographs, Bristols, Gummed Papers and Manilas. For insertion in the Swigart loose leaf folder, the changes represent the strengthened position of these lines in the current paper market.

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## Chemipulp Mill Operation

We are informed by the publisher of the handbook on "Chemipulp sulphite mill operation" mentioned in the November 2 issue of the PAPER TRADE JOURNAL, that copies are being sent to all users of the Chemipulp System and to all who requested copies before publication. After this demand is met copies can be purchased at cost. The book is sold exclusively by the publisher, A. M. Phillips, Buck Terminal Building, Watertown, N. Y.

# Three Groups Interested in Lake Sulphite

## Reports In Circulation Indicate Three Groups May Be Interested In Getting Lake Sulphite Pulp Co. Out of Receivership—Court Rules Trial of Box Companies Be Continued — Manitoba To Distribute $250,000.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., November 13, 1939—Many reports are in circulation in regard to raising the receivership of the Lake Sulphite Pulp Company at Red Rock, Ont., and it is said there are at least three groups interested. Financing the completion of the project is a big undertaking and the possibilities of reorganization are being steadily canvassed. There are many difficulties in the way in regard to raising the necessary new capital as it is reported that upwards of over $5,000,000 would be required to complete the mill for the production of bleached sulphite or rayon pulp. It is suggested that the earlier estimates regarding costs would now have to be revised upwards owing to the higher prices for materials and labor. In connection with the lease of the Lake Nipigon property of the Lake Sulphite Pulp Company to the English River Pulp and Paper Company, this transaction has reference to the property that was purchased some two years ago by the Lake Sulphite Company from the Canadian International Paper Company, at a price of $500,000. The assets include pulpwood limits and ground wood mill of a daily capacity of forty tons. The new operators are using a portion of the pulpwoods stored beside the mill of the Lake Sulphite Company a few miles distant. During the past few weeks the production of ground wood pulp in Canada has become profitable as a result of the sharp advance in the price available on shipments to the United States.

### Trial of Box Companies To Continue

A move by one individual and nineteen box companies charged with unlawfully conspiring or combining to restrain trade to quash the indictment against them failed last week when Mr. Justice MacKay in Osgoode Hall, Toronto, handed down a judgment dismissing the motion. The defendants charged under section 498, sub section I (d) of the Criminal code claimed that the indictment was not within the jurisdiction of the court and the indictment was defective in form. Mr. Justice MacKay turned down the motion on both points and ordered the trial to proceed. Mr. Justice MacKay said "If the construction as contended by counsel for the accused is placed upon this section a person living in Toronto who committed an offence in the county of Peel could not be indicted before a court having jurisdiction in Peel as, for instance, the General Sessions of the Peace, unless apprehended there. I do not find that Section 577 has the limiting effect as contended. I am of the opinion that this court has the jurisdiction to try these accused as charged in the indictment." His Lordship also held that the indictment was properly framed and that as each count of the indictment charges an offense it was not open for him to quash any one of them.

The individual charged is H. J. Badden and the companies are—Container Materials Limited; Wilson Boxes, Limited; Canadian Boxes, Limited; Martin Paper Products, Limited Hilton Brothers Limited; Maritime Paper Products, Limited, Gair Company of Canada, Limited; Hinde & Dauch Paper Company of Canada, Limited; Corrugated Paper Boxes Limited; Hygrade Paper Products, Limited; Martin-Hewitt Containers, Limited; C. W. Hendershot Corrugated Paper Company, Limited; Shipping Containers, Limited; Standard Paper Box, Limited; Canadian Wirebound Boxes, Limited; Superior Box Company, Limited; Acme Paper Box Company, Limited; Dominion Paper Company and Kraft Containers, Limited.

The Hinde & Dauch Paper Co. of Canada, Toronto, made a very satisfactory showing during the last quarter. The net earnings for the first nine months of this year are about $110,000 according to information recently revealed. A few weeks ago it was reported that operations were at a high rate of capacity partly owing to the movement of canned goods overseas. A reversal of the declining trend of prices of the company's products was also reported. Last year Hinde & Dauch earned $1.42 a share but it is probable that the 1939 profits will not reach this level although the current fifty cent annual dividend should be covered.

### Manitoba Paper Co. To Distribute $250,000

More than $250,000 will be distributed to settlers in southwestern Manitoba by the Manitoba Paper Company of Pine Falls this winter in payment for 50,000 cords of pulpwood. The wood is being bought from the residends of the Lac Dubonnet area and along the line of the Greater Winnipeg Water District Railway. Officials of the company said that although there were sufficient supplies of wood to carry the plant for a year at capacity operations, it was decided to let new contracts for wood in order that the settlers in the district should have an opportunity to add to their winter earnings.

### Cut of Pulpwood Nearly Equal to 1937

It is estimated that the cut of pulpwood in the Port Arthur-Fort William district will this season almost equal that of two years ago. The estimated harvest is around 500,000 cords of rough wood in addition to a large cut of peeled pulpwood made during the past summer. Some 3,000 men will find work in the bush and over a third of these are already in camp. For its Mission mill in Fort William and Thunder Bay mill in Port Arthur, the Abitibi Power and Paper Company will either cut or purchase from farmers and settlers 100,000 cords and Provincial Paper, Port Arthur, will take out about 60,000 cords for its year's requirements. The Great Lakes Mill at Fort William will buy any requirements from settlers and has a considerable stock on hand at the plant. Independent loggers and contractors are expected to cut about 100,000 cords. The standard rate of wages is $4 a double cord and $2.25 a single cord.

# Financial News of Pulp and Paper Industry

Abitibi Committees' Work Approved — Dixie-Vortex Shows Increased Profit—Lily-Tulip Cup Corp. Reports Higher Earnings—U. S. Gypsum Company and Great Northern Paper Company Declare Extra Dividends.

**New York Stock Exchange**

High, Low and Last for the Week Ending November 15, 1939

| | High | Low | Last |
|---|---|---|---|
| A. P. W. | 2⅝ | 2⅝ | 2⅝ |
| Armstrong Cork Co. | 38¼ | 37 | 38¼ |
| Celotex Corp. | 10⅞ | 10 | 10½ |
| Celotex Corp., pf. | 61⅛ | 59 | 59 |
| Certain-Teed Products Corp. | 7⅜ | 7 | 7¼ |
| Certain-Teed Products Corp., pf. | 35½ | 33⅛ | 33⅛ |
| Champion Paper & Fibre Co. | 25½ | 25⅜ | 25⅜ |
| Champion Paper & Fibre Co., pf. | 100 | 99½ | 100 |
| Congoleum-Nairn Co. | 25 | 23¼ | 25 |
| Container Corp. of America | 16¾ | 15¼ | 15⅞ |
| Continental-Diamond Fibre Co. | 8⅛ | 7¼ | 8 |
| Crown-Zellerbach Co. | 15¾ | 14¾ | 15¾ |
| Crown-Zellerbach Co., pf. | 89 | 89 | 89 |
| Flintkote Co. | 20⅞ | 19½ | 20¼ |
| Robert Gair | 4⅞ | 4½ | 4½ |
| Robert Gair, pf. | 16⅛ | 15 | 16⅛ |
| International Paper & Power | 13¼ | 12¼ | 12¾ |
| International Paper & Power, pf. | 50¾ | 46⅜ | 49⅛ |
| Johns-Manville Corp. | 76¾ | 75 | 75½ |
| Kimberly Clark Corp. | 35 | 35 | 35 |
| MacAndrews & Forbes | 30¾ | 30½ | 30½ |
| Masonite Corp. | 39 | 38 | 38 |
| Mead Corp. | 11½ | 10¾ | 11½ |
| Mead Corp., pf. | 63 | 63 | 63 |
| Paraffine Companies, Inc. | 44½ | 44½ | 44½ |
| Rayonier Co. | 16¼ | 15½ | 16 |
| Rayonier Co., pf. | 26 | 25¼ | 25¼ |
| Ruberoid Co. | 20¾ | 19⅜ | 20¾ |
| Scott Paper Co. | 48 | 47 | 47 |
| Scott Paper Co., pf. | 115 | 115 | 115 |
| Union Bag & Paper Corp. | 11¼ | 10⅝ | 11¼ |
| United Paperboard Co. | 6¾ | 6 | 6 |
| U. S. Gypsum Co. | 83½ | 78½ | 83½ |

**New York Curb Exchange**

High, Low and Last for the Week Ending November 15, 1939

| | High | Low | Last |
|---|---|---|---|
| American Box Board Co. | 8¼ | 7½ | 8¼ |
| Brown Co., pf. | 21½ | 18½ | 21½ |
| Great Northern Paper | 42 | 40½ | 42 |
| St. Regis Paper Co. | 3⅜ | 3 | 3⅛ |
| St. Regis Paper Co., pf. | 55 | 55 | 55 |
| Taggart Corp. | 5⅜ | 4⅞ | 4⅞ |

## Abitibi Committees' Work Reviewed

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., November 13, 1939—At a recent meeting in Toronto of commitees representing the junior security holders and general trade creditors of the Abitibi Power and Paper Company, Limited, the work of the various committees during late weeks was reviewed by D. H. Gibson, chairman of the Preferred Shareholders Protective Committee, R. G. Meech, K. C., chairman of the common shareholders protective committee and C. Tremblay, chairman of the general trade creditors protective committee. A resolution was unanimously passed by the meeting reaffirming the approval of the represented committees of the Bradshaw plan of reorganization and a communication was forwarded to Mr. Bradshaw and his associates, Hon. G. Howard Ferguson and Hon. Gordon Scott, expressing approval of their intervention and the pledging of the committee's continued support. Strong emphasis was given to the view that the successful reorganization of the Abitibi Power and Paper Company, Limited, is of vital interest to many outstanding communities throughout the province of Ontario. Satisfaction was expressed at the steadily improving conditions in the pulp and paper industry in Canada.

## Dixie-Vortex Earns $838,519

The Dixie-Vortex Company, manufacturers of paper cups and containers, today reported net profits for the 12-month period ending September 30 of $838,519.38, compared with $729,117.79 for the corresponding period a year ago.

Hugh Moore, president, in announcing the profit said sales thus far in the current calendar year are ahead of 1938, and said that orders on hand, partly due to war conditions and advance buying, indicate a steady flow of production through the winter, ordinarily the slack season for the business.

## Blue Lines Inc. to Handle Paper Stock

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., November 11, 1939—Articles of incorporation have been filed with the Indiana secretary of state by the Blue Lines, Inc., 825 East Broadway, South Bend, Ind., to deal in waste paper and rags. The corporation has 1,000 shares of no par value capital stock and the incorporators are William H. Palmer, George C. Palmer, Frank Palmer, Jr., Walter G. Palmer and Irvin W. Cripe.

## National Container Nets $159,744

National Container Corporation for the nine months to Sept. 30, report a net profit, including company's share of affiliates' profits, $159,744, equal to 48 cents each on 330,482 shares of common stock, against $101,321, or 30 cents a share, last year. September quarter: Net profit, $71,798, or 22 cents a share, against $47,021, or 14 cents a share, in third quarter of 1938.

## Lily-Tulip Cup Nets $467,675

Lily-Tulip Cup Corporation and subsidiaries, for the twelve months to September 30, report a net profit after hurricane loss but before provision for excess profits tax, or Federal surtax, of $467,675, equal to $2.47 each on 189,539 no-par capital shares, against $344,819, or $1.82 a share, in preceding twelve months.

## U. S. Gypsum Declares Dividend

The United States Gypsum Company declared an extra dividend of $1.50 a common share, compared with dividends of 50 cents a share paid in previous quarters. This made five dividends aggregating $4 a share payable in 1939, compared with four dividends totaling $2 paid in 1938.

## Great Northern Paper Votes Dividend

An extra dividend of 40 cents a share and the regular dividend of 50 cents a share were declared by Great Northern Paper Company.

# Moisture Vapor Proofness of Wrapping Materials Used on Frozen Foods*

By Clarence W. DuBois and Donald K. Tressler

In the United States there are now approximately 3000 cold storage plants *(1)* offering locker services to farm and other people wishing to preserve fruits, vegetables and meats for home consumption. The development of this and the entire frozen food industry has brought forth many problems. A problem that confronts many engaged in packing frozen foods is the selection of papers and other packaging materials that will protect the products from desiccation and contamination in storage *(2)*. This article will be devoted to a report of findings of the different types of papers and wrappings under study at this Station.

The air in most low-temperature storages usually has a low relative humidity due to the condensation of much of its moisture on the coils of the refrigerating system. Because of this low relative humidity frozen foods held in storage have a tendency to dry out, or desiccate, unless protected by some moisture-vapor proof wrapping or package. In the case of meat and poultry the protector used is usually some type of paper. Papers are also generally used for the lining or wrapping of many types of cartons *(3)*.

## Purpose

The purpose of these tests, which were conducted on a considerable number of the papers offered on the market as packaging material for frozen products, was to ascertain the protective value of these papers to frozen foods in lockers and cartons. For various reasons it was impossible to test all of the papers on the market, but all of the samples submitted to this laboratory by paper manufacturers were tested.

It is important that a wrapping material must prevent desiccation of the enclosed food, protect the food from absorbing outside flavors and odors and protect the food from contamination. It is also important that the paper doesn't crack or become brittle at a low temperature, absorb blood, water, oil or grease, nor impart flavors to the product enclosed. In order to learn whether or not these papers could fulfill these above demands they were subjected to tests to determine: the loss of moisture vapor through the paper, their resistance to bloodstains, grease and oils, soaking up water, imparting flavors to products, brittleness and cracking at low temperatures, and actual storage conditions.

## Methods for Determining Moisture Vapor Transmission

The methods involved in determining the moisture vapor transmission through the papers were those described by Tressler and Evers *(4)*.

Twenty c.c. of water was put in each of a number of crystallizing dishes (4 cm. in diameter) and the water was allowed to freeze. Then a piece of paper to be tested was sealed over the top of each dish using a special wax. Superfluous paper was then trimmed off.

The wax used in sealing the paper to the tops of the crystallizing dishes must possess the quality of not cracking when subjected to low temperatures. The weighings were made in a room held at 10 deg. F. If the sealed paper should crack loose from the dish at this low temperature, the seal would be broken and the test ruined. The wax used was prepared by melting together 22 per cent paraffin, 23 per cent beeswax and 55 per cent petroleum jelly (vaseline).

The covered dishes were then placed in a constant temperature, constant humidity chamber located in a 10 deg. F. room. The temperature was thermostatically controlled at 5 deg. F. with a relative humidity of 50 per cent controlled by a sulphuric acid solution. The papers were then allowed to remain 48 hours, to come to equilibrium with the air before they were weighed and the weights recorded. The dishes were then returned to the chamber for seven days before the second weights were made and recorded. Each paper was run in triplicate. The difference between the first weights and second weights, the average loss per day per dish, the average loss per paper and the loss per square meter were then calculated.

## Results

The figures in Table I are the results of the moisture vapor transmission through the various papers at 5 deg. F., at a 50 per cent relative humidity.

TABLE I.—MOISTURE VAPOR TRANSMISSION OF WRAPPING PAPERS AND LINERS AT +5 DEG. F.

| Paper | Type | Average loss in grams per sq. meter per day |
|---|---|---|
| 1 | Paper waxed two sides | 24.2 |
| 2 | Paper waxed one side | 21.7 |
| 3 | Paper waxed one side | 33.7 |
| 4 | Paper waxed one side | 26.4 |
| 5 | Parchment, no coating | 115.9 |
| 6 | Parchment waxed one side | 18.0 |
| 7 | Parchment waxed two sides | 28.0 |
| 8 | Parchment with special coating | 1.4 |
| 9 | Semi transparent paper | 2.0 |
| 10 | Laminated semi transparent paper | .5 |
| 11 | Special coated vegetable parchment | 1.3 |
| 12 | Special coated vegetable parchment | 2.2 |
| 13 | Special coated sulphite paper | 2.3 |
| 14 | Waxed paper two sides | 26.0 |
| 15 | Transparent viscose sheet (moisture proof) | .8 |
| 16 | Transparent viscose sheet (moisture proof) | 1.0 |
| 17 | Transparent viscose sheet (moisture proof) | .5 |
| 18 | Transparent viscose sheet (moisture proof) | .9 |
| 19 | Transparent viscose sheet (moisture proof) | .6 |
| 20 | Transparent viscose sheet (moisture proof) | 1.3 |
| 21 | Transparent viscose sheet (moisture proof) | .6 |
| 22 | Transparent viscose sheet (moisture proof) | .6 |
| 23 | Waterproofed heat sealing transparent paper | 5.8 |
| 24 | Special wax coated parchment | .9 |

Water-proofness should not be confused with moisture-vapor-proofness since a paper may be water proof without being water vapor proof. A moisture vapor proof material is one that will prevent moisture from diffusing through it. Parchment papers usually are water proof but not water vapor proof. Waxed paper absorbs water and will tear very easily when water soaked.

*Approved by the Director of the New York State Agricultural Experiment Station for publication as Journal Paper No. 343, October 13, 1939.

### Methods for Miscellaneous Tests

In testing the papers for resistance to bloodstains a piece of paper approximately six inches square was taken on which was placed about a tablespoonful of fresh blood and allowed to stand for 20 minutes. This method was repeated with another piece of paper using water to ascertain resistance to water and the results noted.

To test for grease, oil, and flavor imparting resistance, a piece of paper six inches square was taken in which a piece of butter was wrapped and allowed to remain at room temperature for 12 hours. The papers were then opened, the butter tasted by three persons, and the paper examined for grease absorption.

The papers were placed in a 10 deg. F. room for one hour, then tested for brittleness by rubbing the paper between the hands.

Another piece of each paper was tested for resistance of the coating to cracking at 10 deg. F. by wrinkling the paper in the hands. The results were noted.

### Results

Table II shows the results obtained in testing the various papers for resistance to blood and bloodstains, grease and oil, soaking up water, imparting flavors to products, brittleness and cracking at low temperatures.

TABLE II.—RESULTS OF MISCELLANEOUS TESTS

| Paper | Heat Sealing quality | Stain-proof | Grease-proof | Condition at zero | Water-proof | Brittle | Flavor Imparted |
|---|---|---|---|---|---|---|---|
| 1 | Fair | Stains | No | Wax cracks | No | No | None |
| 2 | Fair | Stains | No | Wax cracks | No | No | None |
| 3 | Fair | Stains | No | Wax cracks | No | No | None |
| 4 | Fair | Doesn't show | No | Wax cracks | No | No | None |
| 5 | Not heat sealing | Soaks up stains | Takes up grease | No | No | No | None |
| 6 | Fair | Stains | Not entirely | No | Not entirely | No | None |
| 7 | Fair | Stains | Yes | No | Not entirely | No | None |
| 8 | Good | Yes | Yes | No | Yes | No | None |
| 9 | Good | Yes | Yes | Cracks slightly, no harm | Yes | No | None |
| 10 | Excellent | Yes | Yes | Cracks very slightly | Yes | Quite brittle | None |
| 11 | Excellent | Yes | Yes | No | Yes | No | None |
| 12 | Excellent | Yes | Yes | No | Yes | No | None |
| 13 | Good | Yes | Yes | Slight cracking | Yes | No | None |
| 14 | Fair | Stains | No | Cracks badly | No | No | None |
| 15 | Not heat sealing | Yes | Yes | No | Yes | Very brittle | None |
| 16 | Excellent | Yes | Yes | No | Yes | Slightly brittle | None |
| 17 | Excellent | Yes | Yes | No | Yes | No | None |
| 18 | Excellent | Yes | Yes | No | Yes | No | Oily |
| 19 | Excellent | Yes | Yes | No | Yes | No | None |
| 20 | Excellent | Yes | Yes | No | Yes | Slightly | None |
| 21 | Excellent | Yes | Yes | No | Yes | No | None |
| 22 | Excellent | Yes | Yes | No | Yes | No | None |
| 23 | Good | Yes | Yes | Cracks | Yes | No | None |
| 24 | Good | Yes | Yes | No | Yes | No | None |
| 25 | Not heat sealing | Yes | Yes | No | Yes | No | None |

### Methods Followed in Storage Tests

Pork chops, lamb chops, veal cutlets, and cuts of beef roasts were wrapped in a paper, then a stockinette was pulled over the paper and meat. The stockinette serves as a protection to the package and bring the paper in closer contact with the product on all surfaces. The meats after being packaged in the various types of wrappers were placed on wire racks and frozen in an air blast in a room held at —10 deg. F. After the meat was frozen, it was weighed and then placed on open shelves at —5 deg. F. to —10 deg. F. The room had an approximate relative humidity of 40 per cent. The meats had been stored under these conditions for a period of six months when the second weights were taken. Table III shows the loss of moisture from the package with the appearance observations noted on examination.

TABLE III.—RESULTS OF PRACTICAL TESTS

| Paper | Meat | Per cent weight loss of moisture | Appearance |
|---|---|---|---|
| 1 | Beef | 2.1 | Desiccated |
| 10 | Beef | 0.19 | OK |
| 22 | Beef | 0.12 | OK |
| 3 | Beef | 2.5 | Desiccated |
| 25 | Beef | 0.1 | OK |
| 7 | Beef | 2.6 | Desiccated |
| 11 | Beef | 0.08 | OK |
| 14 | Beef | 4.6 | Desiccated |
| 1 | Pork | 1.4 | Desiccated |
| 10 | Pork | 0.18 | OK |
| 22 | Pork | 0.17 | OK |
| 3 | Pork | 1.8 | Desiccated |
| 25 | Pork | 0.05 | OK |
| 7 | Pork | 3.5 | Desiccated |
| 11 | Pork | 0.17 | OK |
| 14 | Pork | 5.0 | Desiccated |
| 1 | Veal | 3.0 | Desiccated |
| 10 | Veal | 0.12 | OK |
| 22 | Veal | 0.09 | OK |
| 3 | Veal | 2.7 | Desiccated |
| 25 | Veal | 0.08 | OK |
| 7 | Veal | 4.7 | Desiccated |
| 11 | Veal | 0.13 | OK |
| 14 | Veal | 6.0 | Desiccated |
| 1 | Lamb | 1.8 | Desiccated |
| 10 | Lamb | 0.17 | OK |
| 22 | Lamb | 0.18 | OK |
| 3 | Lamb | 2.0 | Desiccated |
| 25 | Lamb | 0.11 | OK |
| 7 | Lamb | 2.5 | Desiccated |
| 11 | Lamb | 0.17 | OK |
| 14 | Lamb | 3.0 | Desiccated |

### Discussion

The temperature at which frozen meat is held has a decided effect on the length of time the meat can be kept without its becoming rancid. The higher the temperature the sooner the fat becomes rancid.

The storage temperature also affects the rate of loss of moisture from meats. The lower the temperature, other conditions being the same, the lower the rate of loss. The fat of meat wrapped in a material that has a low moisture vapor transmission rate does not become rancid as soon as that packaged in a material that has a high vapor transmission rate, probably because a film of moisture on the surface of the meat protects the fat from oxidation by the air.

Frozen meat wrapped in a paper that has a high moisture vapor transmission rate, if stored at a high temperature, e. g. +10 deg. F., is likely to take on off flavors, to absorb "storage" odors and to desiccate.

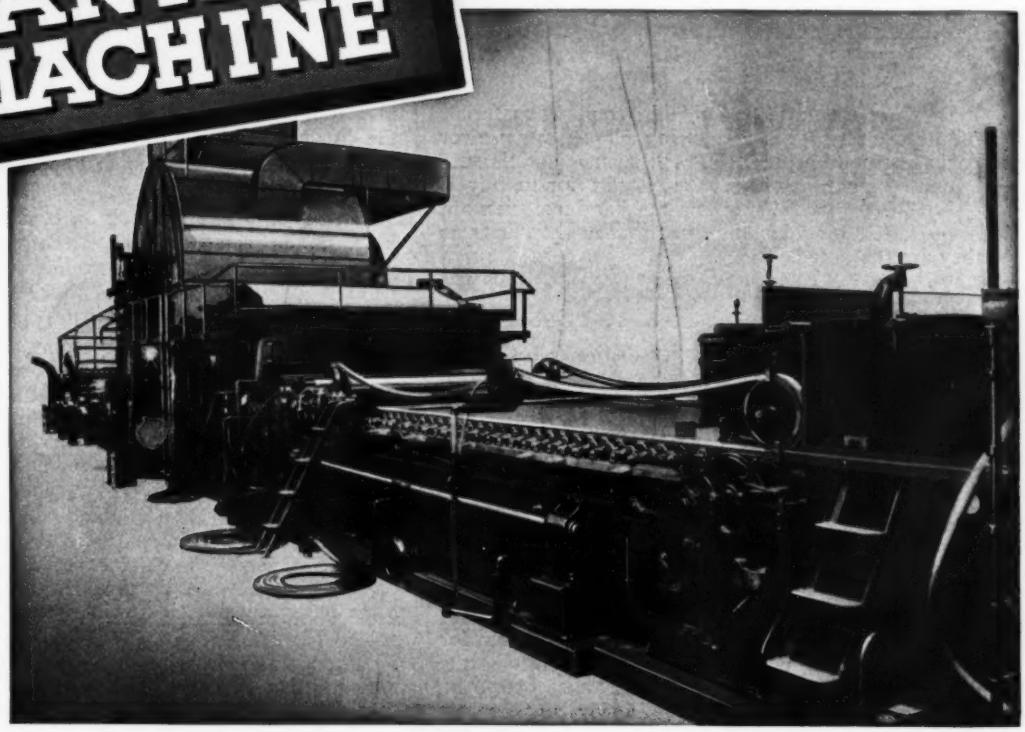
It is evident that the patrons and managers of locker plants should use discretion in selecting the wrapping materials employed in packaging frozen foods. The owners and operators of locker plants should aid their patrons to the utmost in securing and selecting wrapping materials that will satisfactorily protect frozen products from dessication and contamination while in storage.

### Summary

The results of the 25 packaging material tests indicate a wide variation in their adaptation for packaging frozen foods.

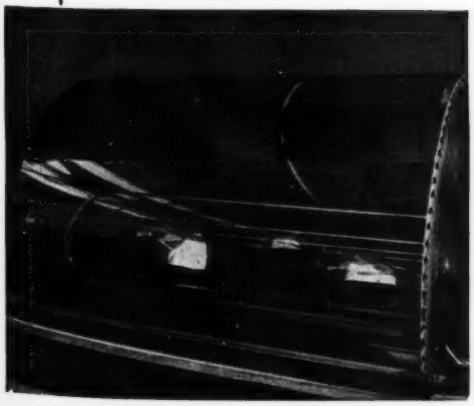
If we assume that a paper or other wrapping material adequately protects meat and other foods from desiccation, if at +5 deg. F., it transmits not more than three grams of moisture vapor per square meter per 24 hours, and if in addition the material is not stained by blood or grease and does not become brittle at low temperature, nor impart a flavor to the food, then our results show that the following materials

# THE Beloit YANKEE MACHINE



● **The Beloit Yankee Machine furnishes an economical easy means of diversification. No other machine has the all-around adaptability to fit the needs of mills making specialty papers, both light and heavy weights.**

**The machine is provided with all the latest features: Removable Fourdrinier ...High Speed Super Shake...Suction Rolls...High Pressure Dryer...Hypoid Drive, etc.**



**Beloit has developed a special alloy metal and special grinding and polishing process to produce the close grained, hard mirror finish shown in this photograph. This is a result of Beloit's many years of experience in building practically all the Yankee machines in this country.**

**Beloit has also recently developed a high pressure Yankee dryer to meet the demand for maximum production.**

*THE BELOIT WAY IS THE MODERN WAY*

**BELOIT IRON WORKS • BELOIT • WIS.**

may be considered satisfactory for use in packaging foods for storage in lockers:

E. I. DuPont de Nemours & Co., Inc.
300 lbs. MAT Cellophane
300 lbs. Sp. MST Cellophane
450 lbs. Sp. MST Cellophane
Sylvania Industrial Corporation
300 lbs. STD. Sylphrap
300 lbs. BU Sylphrap
300 WP Sylphrap
Riegal Paper Corporation
40 lbs. Heat sealing Vegetable Parchment
35 lbs. Heat sealing Ivory Durapak
Diafane
Laminated Diafane
Paterson Parchment Paper Company
Special Coated Parchment
The Menasha Products Company
Paraweld Parchment
Dewey & Almy Chemical Company
Cry-O-Vac latex

It is impossible to test all the wrapping materials on the market suggested as being adapted for use for packaging frozen products. All such materials submitted by manufacturers were tested prior to July 1, 1939. This work is being continued and materials are being tested for adaptability for frozen products as they are submitted.

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(3) Tressler, D. K. and Evers, C. F. The Freezing Preservation of Fruits, Fruit Juices and Vegetables. Avi Publishing Company, New York (1936).
(4) Tressler, D. K. and Evers, C. F. Paper Trade J. *101*, (No. 10) 33-35 (1935).

## International Nets $635,133

Richard J. Cullen in submitting the statement of consolidated profit and loss of International Paper and Power Company and subsidiary companies (excluding International Hydro-Electric System and its subsidiaries) for the third quarter and first nine months of 1939 together with comparative figures for the corresponding periods of 1938 says: "During the three months ended September 30, 1939 volume of business was at the highest level for any quarter since 1937. During September price increases were announced for many grades of paper (reversing the downward tendency prevailing during the summer) but these took effect too late to have much effort on earnings for the quarter. Net profit amounted to $635,133 compared with a net profit of $77,740 for the preceding quarter and a net profit of $12,850 for the third quarter of 1938."

The statement of profit and loss is presented herewith.

## Finland Continues Trade As Usual

Business intercourse between the United States and Finland has been and still is being maintained as usual despite blockades, and the Finnish government's preoccupation at the moment with demands of the Soviet government, Holger R. Sumelius, managing director of the Finnish Paper Mill Assn., said last week.

Mr. Sumelius, now calling on business connections here, saw no reason to believe that serious interference with Finnish-American trade would occur in the future.

Mr. Sumelius became head of the Finnish paper mill group a year ago, succeeding H. J. Procope, who is now Finland's Minister to the United States.

"The Finnish people presented a very solid front on complete independence and absolute neutrality before I left home," said Mr. Sumelius, "and I have every confidence that new conditions have not changed that attitude."

About 85 per cent of Finland's industrial activity, according to the visitor, has to do with timber or timber products. The chief export item is newsprint paper. United States is the principal customer but some newsprint is sold to 40 or more nations.

The Finnish Paper Mills Association shipped out 70 cargoes of newsprint in September, he said, and maintained a similar level in October. The association, whose membership include all but one important producer of paper in Finland, is represented in the United States by Jay Madden & Co.

STATEMENT OF CONSOLIDATED PROFIT AND LOSS

| | Three Months Ended Sept. 30, 1939 | Three Months Ended Sept. 30, 1938 | Nine Months Ended Sept. 30, 1939 | Nine Months Ended Sept. 30, 1938 |
|---|---|---|---|---|
| SALES AND OTHER INCOME: | | | | |
| Gross sales, less returns, allowances and discounts | $29,133,736.48 | $25,048,990.49 | $81,241,869.47 | $70,253,778.40 |
| Other income—net | 46,007.63 | 269,566.55 | 627,953.07 | 752,770.94 |
| | $29,179,744.11 | $25,318,557.04 | $81,869,822.54 | $71,006,549.34 |
| COST AND EXPENSES: | | | | |
| Cost of sales: | | | | |
| Pulpwood, labor, materials, etc. | $18,488,801.03 | $16,006,703.36 | $52,033,952.03 | $44,878,036.25 |
| Maintenance and repairs | 1,625,732.97 | 1,437,508.45 | 4,539,053.95 | 4,224,691.04 |
| Taxes (other than income taxes) | 707,079.43 | 697,932.99 | 2,104,471.18 | 2,016,109.67 |
| Outward freight and delivery expenses | 3,796,923.10 | 3,262,340.83 | 10,584,432.78 | 8,738,972.92 |
| Selling, general and administrative expenses | 1,402,545.61 | 1,377,218.96 | 4,261,184.59 | 4,098,505.53 |
| Provision for doubtful accounts | 153,057.22 | 150,228.91 | 459,534.83 | 455,147.87 |
| | 26,174,139.36 | 22,931,933.50 | 73,982,629.36 | 64,411,463.28 |
| | $3,005,604.75 | $2,386,623.54 | $7,887,193.18 | $6,595,086.06 |
| DEDUCTIONS: | | | | |
| Interest on funded debt | $797,167.25 | $903,214.70 | $2,512,468.07 | $2,696,192.52 |
| Interest on other debt | 1,658.38 | 6,009.32 | 2,266.13 | 14,511.65 |
| Amortization of debt discount and expense | 93,436.77 | 89,252.39 | 280,312.65 | 283,221.46 |
| Depreciation | 1,170,190.70 | 1,106,587.49 | 3,518,075.06 | 3,259,681.21 |
| Depletion | 208,613.65 | 168,069.84 | 581,601.14 | 588,785.91 |
| Provision for income taxes | 82,056.60 | 83,397.89 | 214,603.08 | 387,205.46 |
| Dividends accrued but not being currently paid on preferred stocks of subsidiaries | 17,348.00 | 17,241.75 | 52,566.00 | 53,753.25 |
| | 2,370,471.35 | 2,373,773.38 | 7,161,892.13 | 7,283,351.46 |
| NET PROFIT OR *Loss* | $635,133.40 | $12,850.16 | $725,301.05 | *$688,265.40*(*) |

(*) Loss

In the books and the above consolidated financial statement foreign accounts are stated on the basis of $4.85 for the pound sterling and at parity of exchange for Canadian currency. It is the practice of the companies to reflect in current operations any differences between these rates and the current quotations at the time funds are actually transferred or forward commitment contracts are settled.

At September 30, 1939, the undeclared cumulative dividends on the outstanding Cumulative Convertible 5% Preferred Stock amounted to $11.25 per share or a total of $10,416,768.75.

The above statements are subject to final adjustment at December 31st (end of fiscal year).

## Currencies and Foreign Trade

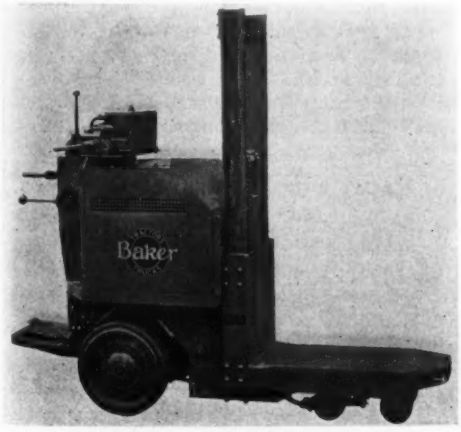
The probable effect of our own neutrality policy and the current sharp upswing in business activity attributed in substantial part by some business writers and economists to the hostilities in Europe, with the possibility that increased volume now may mean a sharp reaction at the beginning of 1940, appear to be the most controversial phases of the present situation. Reciprocal trade agreements have been so prominently advocated in the past two years, and more trade and better business relations with Latin American countries has been so much stressed of late, that a serious study of the several major factors in our domestic economy should be given full consideration.

A study of this kind under the title of "The effect of managed currencies and foreign trade in our domestic economy," by Walter A. Starr, has just been issued by the United States Pulp Producers Association, Oliver M. Porter, secretary, 122 East 42nd street, New York. This study covers in seventeen pages the important aspects of the gold standard, foreign exchange, international currency competition, effect of depreciated foreign currencies on the United States and the result of reciprocal trade agreements. The foreword of the treatise states that, "As a nation, the United States is self-sufficient to a marked degree. Foreign trade represents but a small fraction of our national income—about 5 per cent at present. Other large industrialized nations, such as England, France or Japan, depend on foreign trade for 20 to 30 per cent of their national income."

## New Small Baker Hy-Lift Trucks

Although built to the dimensions of the usual "midget" types of industrial trucks, the new Baker Series F Hy-Lift trucks made by the H. J. B. Baker-Raulang Company, 2168 West 25th street, Cleveland, Ohio, contain no "midget" parts, all units being identical with those in standard Baker trucks up to 5 tons capacity. These new trucks incorporate recent developments in hydraulic lifting equipment and fill a long-felt need for a small, maneuverable truck of rugged, standard units.

These new trucks are built in capacities of 1½ and 2 tons, the latter having a fully compensating, tandem trailing axle and the former a single trailing axle. Standard platforms are from 18 to 36 inches wide, 48 to 72 inches long, and 7 inches high in the lowered position. The tiering models, non-telescoping lifts are available up to 10 feet and a telescoping feature may be had for extreme lifts with a low overall height. One variation of these two trucks is a low-lift model in which the platform lifts to 23 inches above the floor, giving ample clearance for skid legs on a ramp. Another variation offers the platform 9 inches high in the lowered position with larger tires on the trailing axle.




NEW BAKER HY-LIFT TRUCK

The power axle of these little trucks is the standard Baker single-reduction worm drive axle and the travel and hoist motors are of standard Baker construction. The travel controller is the famous Baker NoPlug which makes careful and correct operation compulsory. The hoist controller operates both the pump motor and the valve to the lifting jack cylinder and lowering is by gravity with the speed under complete control of the operator.

In dimensions, these trucks are truly "midgets." The overall width is 32½ inches and, with a platform 48 inches long, the overall length is only 93⅜ inches with the driver's step folded. With the standard 18 inches by 48 inches lift platform, the trucks will operate in intersecting aisles only 56 inches wide. Travel speeds are up to 6 miles per hour and lifting speeds up to 20 feet a minute. Ample battery compartment space is provided for sufficient capacity to work a full shift without difficulty.

## Westminster Expands Line

[FROM OUR REGULAR CORRESPONDENT]

VANCOUVER, B. C., November 10, 1939—The Westminster Paper Company, Ltd., is introducing M.D. (Medical Doctor) sanitary napkins as the latest product of its large and diversified plant at New Westminster, B. C. This is the first time this product has been produced in western Canada. The Westminster Paper Company has had the necessary machinery for this line installed since the extension to its plant a number of months ago, but has delayed production until experiments in this field were made by its affiliated company at Bellingham, Wash., which started production of sanitary napkins a couple of months ago.

The new line is first being introduced in Vancouver, B. C., by a two color large space newspaper campaign. Later in November the advertising will be expanded to include all B. C. and early next year it is expected to expand the campaigns to cover the prairie and eastern Canadian market. The Vancouver, B. C., office of the MacLaren Advertising Agency is handling this account.

One feature of the merchandising policy of the new product will be its distribution through grocery stores as well as drug, department and ladies specialty outlets.

## New Opaque Mimeography Paper

[FROM OUR REGULAR CORRESPONDENT]

GROVETON, N. H., November 13, 1939—The Groveton Paper Company, Inc., has brought out a new opaque mimeograph, called Gropaque, which is endorsed as one of the best sheets of its kind in the field today.

## TAPPI Medal to Otto Kress

By unanimous vote of the executive committee of the Technical Association of the Pulp and Paper Industry honorable mention and the TAPPI medal has been awarded to Otto Kress, technical director of the Institute of Paper Chemistry.

Dr. Kress received his doctorate from Columbia University in 1909 and was the recipient of the Illig medal while at Columbia and was elected to Sigma Xi and Chi Lamda Upsilon. From 1909-1912 he was associated with several paper mills and from 1912-1914 was employed as a dyestuff expert by the Badishe Company. From 1914-1918 he was in charge of the Pulp and Paper Section of the Forest Products Laboratory at Madison, Wis. and in 1918-1919

OTTO KRESS

he was associated with E. I. du Pont de Nemours in connection with their dyestuffs developments.

From 1919-1922 Dr. Kress was technical director of the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis. and from 1922-1929 was superintendent of manufacture at the Thilmany Pulp and Paper Company, Kaukauna, Wis. In 1929-30 he was engaged in consulting work to introduce certain patented processes to the paper industry. Since December 1929 he has been technical director of the Institute of Paper Chemistry.

More than fifty technical publications have appeared over his name or in collaboration with others and twenty-seven patents have been granted to him. He has been chairman of several committees of the Technical Association and is an honorary member of the Superintendents Association. He was also one of the founders of the Lake States Section of TAPPI.

## German Exports of Paper Machinery

The Machinery Division of the Department of Commerce reports that official German statistics show exports of paper and pulp mill machinery in 1938 totaling 15,630,000 reichsmarks ($6,277,200), almost 6 times the corresponding American foreign sales, valued at $1,079,000. Favored by the export subsidy program of their government, including barter and exchange agreements which enabled them to quote extremely competitive prices and credit terms, German exporters outsold American exporters on practically all foreign markets and made substantial sales to some countries where United States producers did not obtain any business during the year.

This was not only true of the European markets, where German manufacturers of paper and pulp mill machinery were further favored by their proximity and obtained slightly over half of their export business, but also in Latin America and other sales areas.

Incomplete statistics show that Germany shipped paper and pulp mill machinery to Latin America in 1938 to the value of $867,900, while the corresponding shipments from the United States amounted to $355,008. The German consignments were directed mainly to Chile, Peru, Argentina and Brazil, which purchased little or no American equipment of this type during the year. The Chilean purchases from Germany totaled $309,664, the Peruvian $265,082, the Argentine $183,148, and the Brazilian $66,672.

## New Rock-Tred Floor Re-surfacer

A new pre-mixed floor resurfacing material now offers a foolproof and economical solution to floor maintenance problems, according to Rock-Tred Company, Inc., of Chicago, the manufacturer.

This development, known as "Rock-Tred", provides a wearing surface throughout its entire thickness and bonds permanently to concrete, metal, rigid wood flooring or asphalt mastic floor, reports the maker. It can be placed indoors or out from ½ inch in thickness to a feather edge and will sustain any load that the sub-floor, driveway, trucking aisle or platform can hold. No chipping, no tedious mixing, no sand or cement are required, it is pointed out, and installation can be made easily by anyone following the simple directions. This resurfacing cures in from 8 to 12 hours and gets harder with age and use.

In addition, Rock-Tred is self-repairing. Use automatically smooths out the slightest surface abrasions. Though the top surface attains the hardness of concrete, its gum-like structure gives the floor a lasting resilience, according to reports from users.

The manufacturer stresses economy, long service life and maintenance-free performance; also its dustless, noiseless, sparkless features. Rock-Tred is said to resist heat, fire and acid and is a non-conductor of electricity.

For further details, write to Rock-Tred Company, Inc., 629 West Washington, Chicago.

## Paper Stock Market Stronger

BOSTON, Mass., November 13, 1939—The paper stock market is in a stronger position today than it was some four months ago. During September and early October paper mills bought large quantities freely, "loading up" with stock. Since then a slight reaction developed, with the mills curtailing purchases. This lessening in buying, however, has not weakened prices any. A resumption of former activity is looked for as there is not a great supply of paper stock on hand. Stocks that had been on hand for a long time moved in September.

## Paper Safety Section Elects Officers

The following officers were elected by the Paper and Pulp Section of the National Safety Council at its annual convention at Atlantic City, N. J., recently.

General Chairman—D. B. Chant, Ontario Pulp and Paper Makers' Safety Association, Toronto, Ont.

Vice-Chairman In Charge of Membership—C. O. Holmer, Minnesota and Ontario Paper Company, Minneapolis, Minn.

News Letter Editor—D. A. McAlary, Fraser Companies, Ltd., Madwaska, Me.

Contest Committee—A. Scott Dowd, chairman, *The Paper Industry and Paper World*, Chicago, Ill.; B. D. Rogers, Bird & Son, Inc., East Walpole, Mass.; F. H. Rosebush, Nekoosa-Edwards Paper Company, Port Edwards, Wis.

Data Sheet Committee—R. G. McGivney, chairman, Oswego Falls Corporation, Fulton, N. Y.; J. J. Hastings, Port Huron Sulphite and Paper Company, Port Huron, Mich.; D. T. Meany, New Brunswick International Paper Company, Dalhousie, N. B., Can.; James W. Towson, West Virginia Pulp and Paper Company, New York, N. Y.

Engineering-Safe Practice Committee — Arthur Murray, chairman, Container Corporation of America, Chicago, Ill.; Francis T. Rooney, George Banta Publishing Company, Menasha, Wis.; M. W. Dundore, Beloit Iron Works, Beloit, Wis.; G. R. Vaughan-Evans, Anglo-Newfoundland Development Company, Ltd., Grand Falls, Newfoundland.

Health Committee Chairman — Dr. Louis H. Frechtling, Champion Paper and Fibre Company, Hamilton, Ohio.

Statistics Committee Chairman—Fred W. Braun, Employers Mutuals, Wausau, Wis.

Publicity Committee—Walter E. Strong, chairman, Menasha Products Division of Marathon Paper Mills Company, Menasha, Wis.; M. L. Mammen, Crown Willamette Paper Company, Portland, Ore.; A. S. Cook, Quebec Pulp & Paper Safety Association, Quebec, Can.; Roland W. Richardson, the Gardner-Richardson Company, Lockland, Ohio.

Safety Instruction Card Committee — R. W. Croucher, chairman, Minnesota & Ontario Paper Company, International Falls, Minn.; H. P. Heubner, Flintkote Company, New York, N. Y.; Ernest Augustus, the Mead Corporation, Chillicothe, Ohio; G. J. Bienvenu, Gaylord Container Corporation, Bogalusa, La.; S. H. Brown, Union Bag and Paper Corporation, New York, N. Y.; Arthur E. Winslow, Hollingsworth & Whitney Company, Waterville, Me.

Visual Education Committee—Julius A. Draper, chairman, Consolidated Paper Corporation, Ltd., Montreal, P. Q., Can.; Don E. McDowell, Kalamazoo Vegetable Parchment Company, Parchment, Kalamazoo County, Mich.; D. S. Garber, Hummel & Downing Company, Milwaukee, Wis.; L. R. Simpson, the Brown Paper Mill Company, Inc., Monroe, La.; J. R. Latter, Anglo-Canadian Pulp and Paper Mills, Ltd., Quebec, Can.; K. G. Urfer, Hawley Pulp and Paper Company, Oregon City, Ore.

Past General Chairmen—George J. Adams, International Paper Company, Glens Falls, N. Y.; Robert M. Altman, Marathon Paper Mills Company, Rothschild, Wis.; Kenneth L. Faist, the Champion Paper and Fibre Company, Hamilton, Ohio; E. E. Grant, the Crystal Tissue Company, Middletown, Ohio; Walter A. Gleason, Hammermill Paper Company, Erie, Pa.; M. G. Hoyman, Kimberly-Clark Corporation, Neenah, Wis.; G. W. Phillips, the Champion Paper and Fibre Company, Canton, N. C.; J. J. Plzak, Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis.; Samuel Pruyn, Finch-Pruyn & Co., Inc., Glens Falls, N. Y.; S. F. Shattuck, Kimberly-Clark Corporation, Neenah, Wis.; George E. Williamson, Strathmore Paper Company, West Springfield, Mass.

## Kalamazoo TAPPI Discusses Calenders

The Kalamazoo Valley Section of the Technical Association of the Pulp and Paper Industry met Thursday, November 2, at the Park American Hotel in Kalamazoo.

The speaker for the evening was Ward Wheeler of the Appleton Machine Company, Appleton, Wis. who talked on "Calender Developments". Mr. Wheeler began by outlining the various methods that have been used to put a finish on paper, from the sliding wooden block of the ancient Chinese to the super calender of today. He then described the different types of rolls used on calenders, how they are manufactured, and the advantages and disadvantages of each. The three main points the roll manufacturer has to watch are: 1. Resilience, which property imparts the finish to paper; 2. Hardness, in relation to "marking", for if the roll is too hard the marks are sharper and more noticeable; and 3. Heat Resistance so as to prevent roll "blowouts". In Mr. Wheeler's opinion the old fashioned method of applying pressure to the rolls with lever and weights is still perhaps the best.

A lively discussion followed Mr. Wheeler's talk, in which many controversial matters were aired, such as: wide calenders running an entire reel against narrower calenders running split reels; the advisability of having a rewinder on the calenders or as a separate unit; the most economical speed at which a calender should be run; and the benefits, if any, of anti-friction bearings.

Those who attended were: C. W. Abbott, Ray L. Barton, Harry C. Bradford, Robert Buss, Fred L. Chappelle, A. W. Cole, Joe Denneny, F. L. Denner, F. L. Dennett, Arthur G. Dreis, R. D. Freeman, Paul deGuehery, F. R. Hamilton, A. E. Hays, Harold Heath, John A. Heenan, G. I. Ingling, W. I. Keirn, W. K. Kidder, W. A. Kirkpatrick, L. H. Mimms, Henry Nendorf, R. A. Olson, Al. Perlick, F. C. Peterson, Vincent Rawlinson, Geo. H. Rice, Martin J. Roberts, E. C. Rutz, Fred Scheid, L. J. Scheid, H. E. Stafford, H. M. Taber, W. S. Taylor, R. M. Upright, Joe Waber, Arthur Weinland and W. O. Wheeler.

## New Mill For Northern Ontario

There is a rumor in Northern Ontario that a new pulp and paper mill will be erected at Mattice, Ont., which is one hundred miles west of Cochrane and along the northern transcontinental line of the Canadian National Railways. A Toronto firm has been buying up all available sites in the town. There are vast tracts of good pulpwood in the area surrounding Mattice and the timber could be floated in on the Missanaiba river to the proposed mill and pulp plant.

## Indianapolis Demand Steady

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., November 13, 1939—Steadiness was the chief characteristic the last week in paper demand in this territory. In the fine paper field some jobbers report a slight decrease in demand, but nothing to worry about and they are convinced the remainder of the year will hold the volume now established. Prices of flat paper have shown no appreciable change and are holding their own in nice shape. Envelope prices appeared to be a bit stronger. Most of the trade hopes that following the war flurry, business conditions will settle down to a more or less normal basis and that no drastic changes will be made. Warehouse stocks are heavier than they were before September and in spite of the closeness to inventory, likely will be kept at about the present point. It is certain stocks at inventory will be considerably larger than they were a year ago.

As was to be expected, demand for building paper and roofing has sunk with the coming of cooler weather. Jobbers say there is a better demand now than a year ago, but dealers are buying much more cautiously in an effort to keep the carry-over as low as possible. It is expected, however, that there will be some demand for building papers all during the winter months.

Newsprint demand continues fairly strong. Linage in most of the metropolitan papers is slightly higher than it was this time a year ago and a steady increase is expected from now until Christmas. With Thanksgiving in Indiana a week earlier by decree of the Governor, the regular Christmas advertising will start a week earlier than had been expected. Volume from the country weeklies continues about the same.

Wrapping paper and bags are holding steady with prices firm. Demand should be better during the next two weeks. Kraft shows no change.

The container trade is getting ready for the Holiday season and early reports are that demand will be good. Orders now are being placed by several industries that use decorative packaging for their Christmas wares.

No appreciable change is to be seen in the waste paper and rag market.

## Wood Pulp Imports for September

The United States import trade in wood pulp for September was marked by a sharp increase in receipts from Canada, a lesser increase in shipments from Finland, and decreased imports from Sweden and Norway in comparison with the preceding month, it was announced today by the Forest Products Division, Bureau of Foreign and Domestic Commerce, Department of Commerce.

Preliminary data shows that 160,417 tons of wood pulp valued at $5,880,141 were imported during September, which was 6.5 per cent above August imports but 1.6 per cent less than the volume imported in September 1938.

Imports from Finland increased 14 per cent above August figures to 33,641 tons. Imports from Canada increased 52 per cent during the month to 68,356 tons.

Swedish imports decreased 19 per cent to 53,724 tons, and Norwegian imports were 42 per cent below the August figures of 4,202 tons.

The month's imports of 49,145 tons of unbleached sulphite pulp came from the following sources: Finland, 13,417 tons; Norway, 1,111 tons; Sweden, 22,297 tons; and Canada, 12,307 tons. Bleached sulphite imports from all countries aggregated 39,785 tons of which Norway supplied 2,538 tons; Finland, 7,531 tons; Sweden, 3,217 tons, and Canada, 26,018 tons.

Unbleached sulphite wood pulp imports totaled 38,876 tons with Finland accounting for 8,963 tons; Norway, 553 tons; Sweden, 22,111 tons; and Canada, 7,249 tons. Bleached sulphite wood pulp imports totaled 8,087 tons, with Finland supplying 634 tons; Sweden, 2,795 tons; and Canada, 4,668 tons. Canada supplied the entire importation of 950 tons of soda pulp.

Unbleached mechanical wood pulp imports, aggregating 23,574 tons, were obtained chiefly from Canada, that country shipping 17,164 tons. Imports of 3,096 tons were received from Finland and 3,314 tons from Sweden.

## Potdevin at Graphic Arts Exposition

Potdevin salesmen were hard pressed taking care of the numerous visitors who came to their two booths at the recent Graphic Arts Exposition in New York City. Greatly responsible for the interest displayed were two Potdevin aniline web printing presses. One

THE POTDEVIN EXHIBIT.

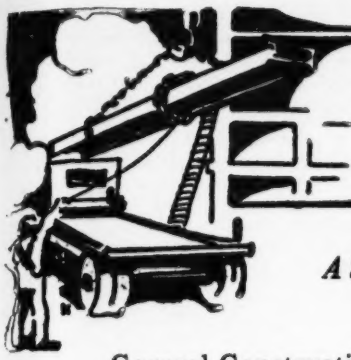
of these was for combination to a converting unit; the other a 3-color roll-and-rewind press.

In its main booth the Potdevin Machine Company, which is located at 1223 38th street, Brooklyn, N. Y., had operating a sheet gluer, a margin gluer and several hand- and motor-driven label pasters and a rotary press. Also exhibited was a static eliminator for removing the electricity from webs or sheets of paper.

Several enlargements of Potdevin oil and aniline presses were shown. Over three dozen books of photographs and boxes of aniline, oil-ink and rotogravure sample printing were on hand to show interested visitors.

## Appoints Brown Western Manager

Robert C. Brown has been appointed Western manager of the Tympan Division of the Cromwell Paper Company, Chicago. He will be in charge of sales in all states west of the Mississippi River. Mr. Brown is well known in the paper industry and comes to The Cromwell Paper Company with a successful sales record from the Kimberly-Clark Corporation. He had been with the latter concern for twenty-three years.



# CONSTRUCTION NEWS

*A Summary of Vital Facts Regarding Construction, Financing and Operation of Pulp and Paper Mills*

## General Construction News

**Brunswick, Ga.**—The Brunswick Pulp and Paper Company, manufacturer of bleached sulphate fiber, has plans under way for expansion and improvements in mill, including new addition for considerable increase in present capacity. Entire project is reported to cost about $500,000, including equipment, and will be carried out over a period of months. Work is scheduled to begin at early date.

**International Falls, Minn.**—In connection with reorganization plans of the Minnesota and Ontario Paper Company, Builders' Exchange Building, Minneapolis, Minn., with mill at International Falls, the Insulite Company, with mill at same place, will become a division of the parent company, continuing in the line of wallboard and insualtion products. All other affiliated companies of the first noted organization will be merged with that company, in accordance with the reorganization program to be presented to the Federal Court on November 27. The Insulite Company mill will be maintained at present location, with proposed expansion in output.

**Cleveland, Ohio**—The Acme Paper Stock Company, 6204 Central avenue, has plans maturing for rebuilding of portion of two-story storage and distributing building, location noted, recently damaged by fire, and proposes to begin work as soon as insurance has been adjusted.

**Kansas City, Mo.**—The C. F. Downey Box Company, 14th and Iron streets, manufacturer of corrugated boxes and containers, has rejected bids recently received for new addition to plant, previously referred to in these columns, and project will be held in temporary abeyance. Proposed expansion consisted of a one-story extension, 50 x 196 feet, with new boiler house, reported to cost close to $60,000, and will be carried out at a later date. Charles A. Smith, Finance Building, Kansas City, is architect.

**Adrian, Mich.**—The Simplex Paper Corporation, manufacturer of building and insulating papers, strawboard products, etc., is running on a capacity schedule at two mills at Palmyra, near Adrian, giving employment to a full working force on a 24-hour day basis, divided into three eight-hour shifts. It is expected to hold to this operating basis for an indefinite period.

**Everett, Wash.**—The Soundview Pulp Company, manufacturer of bleached sulphite pulp, has work under way on new one-story addition to mill, 25 x 112 feet, recently referred to in these columns, and will push to early completion; work will include installation of a battery of six new concrete tanks, each 18 x 32 feet, for bleaching department, with auxiliary equipment. The Austin Company, Dexter-Horton Building, Seattle, Wash., is general contractor for the work, which is reported to cost approximately $60,000. The Soundview company is operating on a capacity production schedule, with output in October estimated at close to 14,000 tons, one of the highest monthly totals in the history of the mill.

**Plymouth, N. C.**—Expansion program at the mill of the North Carolina Pulp Company, Plymouth, manufacturer of sulphite fiber products, lately noted in these columns, will consist of a group of five new one-story additions, three of which will be used for increased capacity in wet wash and bleaching departments; another unit will be used for expansion in the machine division and the last structure for extensions in finishing department. Company also will make enlargements in boiler plant. Program is reported to cost in excess of $200,000. The William Muirhead Company, Durham, N. C., has the general erection contract, with steel framing to be furnished by the Bethlehem Steel Company, South Bethlehem, Pa. An award for roofing has been made to the Federal American Cement Tile Company, Architects' Building, Philadelphia, Pa. It is expected to complete the project early next year. Company is a division of the Kieckhefer Container Company, Delair, N. J.

**Little Falls, Minn.**—The Hennepin Paper Company, manufacturer of roofing and kindred paper stocks, is advancing operations at local mill, with the adoption of a three-shift daily working schedule, instead of two shifts as heretofore. The working force has been increased to about 62 men. The plant was formerly given over to other lines of paper manufacture and has been re-equipped and improved for the production of roofing specialties, on which it will concentrate in future.

**St. Louis, Mo.**—The Envelope Manufacturing Company, 121 Clark avenue, manufacturer of commercial envelopes and kindred paper stocks, has work under way on new one-story converting plant, 130 x 131 feet, at Leffingwell avenue and Pine street, and will push the project to early completion. Large increase in present capacity will be carried out. New unit is reported to cost close to $75,000, with equipment. The R. W. Morrison Construction Company, Wainwright Building, St. Louis, has the general erection contract. O. J. Krieg, last noted address, is architect.

**Pasadena, Tex.**—The Champion Paper and Fibre Company, Houston Division, Pasadena, has super-

structure under way on new addition to mill, consisting of several large one and multi-story units, previously referred to in these columns, and proposes to have the plant ready for operation next spring. It will be used for the production of coated book and magazine papers, and is estimated to cost approximately $3,000,000, with equipment. General erection is being carried out by the Merritt, Chapman & Scott Corporation, 17 Battery place, New York, N. Y. The H. K. Ferguson Company, Hanna Building, Cleveland, Ohio, is engineer for the project.

**Norwalk Conn.**—C. R. Gibson & Co., 118 East 16th street, New York, N. Y., paper products, have begun construction of new lithographing plant at Norwalk, for which general contract recently was let to the Austin Company, 16112 Euclid avenue, Cleveland, Ohio. It will consist of a main one-story building, 100 x 209 feet, to be equipped for large production, and office unit adjoining, 30 x 80 feet. Cost estimated over $75,000, with equipment.

**Brooklyn, N. Y.**—The Bush Terminal Waste Paper Company, recently organized, has leased the two-story building at 601-05 Sackett street, and will occupy for storage and distribution.

**Rochester, N. Y.**—The Rochester Envelope Company, 72 Clarissa street, manufacturer of commercial paper products, has asked bids on general erection contract for new addition to plant, recently noted in these columns, to be one-story, estimated to cost close to $40,000, with equipment. Considerable increase in present capacity will be provided. It is expected to begin construction this fall.

**Indianapolis, Ind.**—The Indianapolis Paper Container Company, 217 West 10th street, manufacturer of paper boxes and containers, has work under way on new one-story addition to plant, 31 x 118 feet, to be used primarily for storage and distribution. General contract was let recently to the A. V. Stackhouse Company, 635 North Pennsylvania street. Cost is reported close to $35,000, including equipment.

**Brevard, N. C.**—The Ecusta Paper Corporation, Brevard, organized last year to construct and operate a mill in vicinity of Brevard for the manufacture of cigarette papers, a Delaware corporation, has arranged for increase in capital from $1,500,000 to $2,100,000, for general operations. Company will maintain headquarters at Pisgah Forest, N. C. Company mill is being completed and operations are scheduled at early date. Plant consists of a large group of one and multi-story buildings, and is reported to represent an investment of close to $2,000,000. Equipment and facilities have been provided for extensive output.

**Montreal, Que.**—The National Gypsum Company, Inc., 190 Delaware avenue, Buffalo, N. Y., manufacturer of wall board, insulation materials, etc., is said to have negotiations under way for acquisition of propety at Montreal, as site for large mill in that district. Proposed plant will comprise several one-story units and is reported to cost in excess of $500,000, including equipment.

**St. Jerome, Que.**—The Rolland Paper Company, Ltd., 116 St. Paul street, West, Montreal, Que., manufacturer of bond, ledger and other writing paper stocks, has awarded general contract to J. E. Vincent, 8053 Henri Julian street, Montreal, for new addition to mill at St. Jerome, recently referred to in these columns, and work will be placed in progress at once. Expansion and improvements at the mill will provide about 25 per cent increased capacity, with cost reported over $150,000, including equipment.

### New Companies

**Wilmington, Del.**—The American Cellulose Products Corporation, care of the U. S. Corporation Company, 19 Dover Green, Dover, Del., and 150 Broadway, New York, N. Y., has been chartered under Delaware laws with capital of $625,000, to manufacture and deal in cellulose products. The incorporators include Edwin E. Lindgren and John E. Cosgrove, New York.

**New York, N. Y.**—The D. Sancilio Paper Stock Company, Inc., has been incorporated with capital of $10,000, to deal in waste paper stocks. New company is represented by Jancourtz & Goldman, 276 Fifth avenue, New York, attorneys.

## SURVEY OF NEWSPRINT COMPLETED

*(Continued from page 9)*

to post-war conditions, the effect of labor and other advertising media, the rise of a southern states newsprint industry, and so on. The conclusion is that if Canadian newsprint manufacturers use the present phase of returning prosperity to consolidate their "somewhat precarious condition," and exercise foresight both in regard to production efficiency and customer relations, the industry may be able to pull itself permanently out of the "feast or famine" category.

But it is emphasized that any attempt to increase existing productive facilities should be defeated, for even under existing conditions a production at the rate of 75 per cent of present capacity is all that can reasonably be expected.

### Price of Bleached Sulphite Pulp

Canada to date has been exporting only a limited quantity of its sulphite pulp production, utilizing most of it here. Now, however, there are increased demands from other countries, notably the United States, with high prices quoted in the spot market. Under the circumstances, the prediction is made that with the start of the new year the Canadian contract price for bleached sulphite is likely to be advanced.

## W. John Shaw Dead

W. John Shaw, vice president and manager of the Pittsburgh Division, the Alling & Cory Company, died at his home Friday afternoon, November 10, after a short illness.

Mr. Shaw became associated with the Fine Paper Department of The Alling & Cory Company in 1920 and after several promotions was made Manager of Sales in 1934. On the death of Mr. Alan Chandler in 1938, Mr. Shaw was appointed vice president and manager. He was a director of the company and a member of the Pittsburgh Chamber of Commerce.

Mr. Shaw's untimely death comes as a shock to his many friends in the Paper and Printing Industries. He was 54 years of age and is survived by his widow, Mrs. Sophia Woods Shaw, and son, Jack; a brother, Daniel Shaw of Carrick; and a sister, Jeanette Shaw living in California.

## New Literature

A new synthetic resin gum, RHotex A-20, is described in a folder issued by Rohm and Haas Company, 222 West Washington Square, Philadelphia, Pa. This product is the sodium salt of a polymerized resin acid in an aqueous solution. Applications include its use as a water soluble thickener, colorless film base, solvent resistant coating, printing paste thickener, warp sizing agent, emulsifying and dispersing agent, and adhesive compounder. Leaflets are available on request.

The Armstrong-Stamm moisture control system is described in bulletins just issued by the Armstrong Machine Works, Three Rivers, Mich. It is stated to be a simple and dependable method for controlling the moisture content in paper produced on Fourdrinier and cylinder machines. The Armstrong Thermal air eliminator, an automatic device providing a blast type of discharge of large amounts of air from paper machines, is also described. A third product is the Armstrong constant pressure regulator. This device was developed to meet the need for an extremely accurate and durable pressure control to be used with the Armstrong paper machine moisture control system.

Water cooled furnaces is the subject of a new 32-page bulletin issued by the Babcock & Wilcox Company, 85 Liberty street, New York. It discusses functions of water cooling for boiler furnaces and gives details of the B & W water cooled furnace construction and varied typical applications. Copies are available on request.

Reinforcing devices and methods for all types of shipping packages, are described in a booklet issued by the Acme Steel Company, 2832-40 Archer avenue, Chicago, Ill. This publication is of interest to all shippers and particularly helpful for exporters in assuring the safe arrival of shipments at foreign destinations, and to also prevent pilferage and damage claims.

The Gerrard wire-bundling machine is described in a new folder issued by the Gerrard Company, 2915 West 47th street, Chicago, Ill. This semi-automatic machine is portable, wire is fed from coils, and the wire knot passes U. S. Postal regulations. Car liners, bags, etc., may be tied into packages of any size with a minimum of time and expense.

Lo-maintenance motors and Texrope drives, is the subject of a new booklet, No. B-6029, issued by the Allis-Chalmers Manufacturing Company, Milwaukee, Wis. It contains a large amount of data helpful to buyers in estimating costs, types and sizes of drive equipment and motors to be used under various operating conditions. It is of special value to industrial engineers, architects, builders and contractors.

## R. H. Viegler Entertained in Boston

BOSTON, Mass., November 13, 1939—Robert H. Viegler, the new assistant secretary of the National Paper Trade Association of the United States, who was in town for two days, was entertained and introduced at a luncheon held in his honor at the Boston Chamber of Commerce, Thursday, November 8, by the Wrapping Paper Division of the New England Paper Merchants Association.

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PAPER TRADE JOURNAL

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Ronald G. Macdonald
Editor Technical Section

Lynne M. Lamm
Washington Correspondent

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## COMING EVENTS IN PAPER INDUSTRY

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

## TAX REVISION

The need for Federal tax revision, temporarily obscured by events in Europe is coming into prominence again. Unlike the situation of many countries abroad, business problems are of more importance to the citizens of this country than are military objectives. One of the most difficult and the most important problem confronting the nation is how to revise the present unsound tax policy of the Roosevelt Administration. The budget is still far out of balance, with the prospect that it may long remain so. The present tax system not only irritates business but fails to produce sufficient income to remedy budget troubles. A new wave of demands for more and larger subsidies and expenditures for armament is indicated in the recent revival of political maneuvering.

Last month the Merchants Association of New York, acting on the invitation of John W. Hanes, Under-Secretary of the Treasury, submitted recommendations for the amendment of the Federal tax laws with the object "to maintain government revenues and at the same time encourage the greater flow of capital into productive enterprise." In presenting the proposals Laurence A. Tanser, chairman of the Committee on Taxation and Public Revenue, stated that the association recognized that government will have need for large revenues in the next few years. "We feel however," Mr. Tanser said, "that these revenues can be obtained in a manner which will be less deterrent to business enterprise than have been some of the provisions in the present laws."

The plan recommended by the Merchants Association of New York advocated the repeal of the capital gain and loss provisions of the income tax law. It also recommended that individual surtax rates be reduced from the present maximum of 75 per cent to 50 per cent and the adoption of taxation on all future issues of Federal securities. Another recommendation was made for the simplification of corporation taxes and it was urged that the present graduated corporation tax be abandoned and a flat tax at a fair rate, with reasonable exemptions, be substituted for it. These and other recommendations, if adopted, would prove a real value as a solid foundation for real prosperity. With a national income of around $90 billion a year needed, according to New Dealers, the national income is now at the rate of $67 billion a year. As New Dealers now talk of a $9 billion annual budget, when last year they talked of a $7 billion minimum budget, a substantial increase in income is clearly required if the budget is to be balanced. If no greater progress in making both ends meet is made in the future than has been made in the past, there is little hope but that Federal finances will go from bad to worse.

A broad outline of tax revision legislation which business will seek to have enacted in the next session of Congress was made public last week by the Federal Finance Committee of the Chamber of Commerce of the United States. The Chamber's recommendations were drafted at the request of the Treasury for consideration in its study of tax deterrents. It is the intention of the Chamber's committee, under the chairmanship of Ellsworth C. Alvord, former Treasury tax adviser, to continue with its tax revision study so as to be ready to present a detailed program to the next Congress. Beginning with the limited revenue act of 1939 which was definitely beneficial to the upturn in business and employment which began soon after the adoption of that act, the committee predicts that the current recovery pace would be accelerated by further rational changes in the Federal tax structure.

With this end in view the committee proposes about 40 changes in the present revenue laws, presenting specific recommendations, with supporting arguments and data. Some of the more important of these recommendations are, the reduction of corporate income tax rate by progressive steps to 15 per cent. Restoration of right to file consolidated returns by corporations affiliated by 95 per cent stock ownership. Reduction of individual surtaxes to point of maximum revenue and encouragement to investment, with maximum surtax not to exceed 40 per cent. Simplication of the capital gains and loss provisions, shortening the holding period, with the rate on capital gains reduced to 12½ per cent.

It is proposed by the Chamber's committee "That the Ways and Means Committee recommend that early consideration be given to possible reduction in the level of expenditures, in the interest of fiscal stability. That the Ways and Means Committee call

attention to the fact that present revenue and expenditure policies are resulting, on the one hand, in material encroachment upon likely sources of revenues for state and local governments and, on the other hand, in large payments to the state and local governments in response to their requests for assistance and; That the Ways and Means Committee undertake to reduce such encroachments of the Federal revenue system upon likely sources of state and local revenues if steps be taken to reduce the Federal payments which are made in assistance to the state and local governments."

To remedy this increasing encroachment by the Federal government, the Chamber's committee proposed gradual relinquishment of some of the Federal governments' claims upon state and local sources of revenue to permit a greater exercise of their taxing power. Such a course, it is pointed out, also would permit a reduction in Federal expenditures which now are being made in behalf of state and local governments.

## Willard S. Augsbury Estate

[FROM OUR REGULAR CORRESPONDENT]

ANTWERP, N. Y., November 6, 1939—Willard S. Augsbury, former state senator, retired banker and paper manufacturer, who died recently, left an estate valued between $150,000 and $200,000, according to his will which has been probated. Specific bequests including trust funds amount to $42,500. The residuary estate all goes to his nephew, Frank A. Augsbury, jr., of Ogdensburg. Frank A. Augsbury, prominent paper manufacturer, is named executor. Among the beneficiaries under the will are the Phillips Exeter Academy, House of the Good Samaritan and Mercy Hospital, Watertown, First Congregational Church, Antwerp, and the Crosby Public Library, of Antwerp. All of the personal property in his residence is bequeathed to his two brothers, Frank A. Augsbury, of Ogdensburg, and John C. Augsbury, of Yosemite, Cal. Frank A. Augsbury, executor, is authorized to sell all real estate outside of the residue and there is a provision that if he dies or renounces the executorship the Northern Trust Co. shall be appointed in his place.

## Government Paper Bids

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 15, 1939—The Government Printing Office has received the following bids for 25,000 sheets of 24 x 36 white cloth lined paper; Middlesex Products Corp., $86.00 per M sheets, less 2 per cent; Resolute Paper Products Corporation, $92.90 less 2 per cent; Thomas Barrett & Son, $97.40; Cauthorne Paper Company, Inc., $88.49; Nashua Gummed Coated Paper Company, $98.33 less 2 per cent; Mathers-Lamm Paper Company, $97.41; Virginia Paper Company, $88.60; Whitaker Paper Company, $87.72; Mudge Paper Company, $88.19; R. P. Andrews Paper Company, $91.20.

For 100 pounds of 38 x 56 tan press board; R. P. Andrews Paper Company, .625 cents per sheet; and Case & Risely Paper Company, 61 cents.

## Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES[1]

| Months | 1939 | 1938 | 1937 | 1936 | 1935 | 1934 |
|---|---|---|---|---|---|---|
| January | 77.5% | 63.9% | 90.3% | 76.1% | 65.8% | ..... |
| February | 81.7% | 68.7% | 90.1% | 77.9% | 70.0% | ..... |
| March | 84.0% | 69.6% | 90.3% | 76.0% | 70.5% | ..... |
| April | 82.9% | 68.3% | 92.1% | 82.3% | 70.0% | ..... |
| May | 80.2% | 69.0% | 90.6% | 81.6% | 69.4% | ..... |
| June | 79.7% | 66.0% | 87.3% | 80.7% | 72.3% | ..... |
| July | 75.2% | 72.0% | 81.8% | 77.3% | 64.9% | ..... |
| August | 82.9% | 77.2% | 82.9% | 81.5% | 70.9% | ..... |
| September | 88.7% | 76.3% | 78.6% | 80.5% | 71.9% | 58.2% |
| October | 96.6% | 82.5% | 73.5% | 87.6% | 75.6% | 64.7% |
| November | ..... | 79.6% | 61.9% | 88.0% | 75.3% | 61.7% |
| December | ..... | 74.4% | 54.5% | 85.9% | 71.2% | 59.6% |
| Year Average | ..... | 72.3% | 80.6% | 81.3% | 70.5% | ..... |
| First 44 weeks | 83.1% | 71.5% | 85.1% | 80.4% | 70.1% | ..... |

COMPARATIVE WEEKLY SUMMARIES[1]

| CURRENT WEEKS, 1939 | | CORRESPONDING WEEKS, 1938 | |
|---|---|---|---|
| September 30 | 95.6% | October 1 | 81.1% |
| October 7 | 93.0% | October 8 | 81.6% |
| October 14 | 96.9% | October 15 | 83.0% |
| October 21 | 98.6% | October 22 | 83.8% |
| October 28 | 98.2% | October 29 | 81.8% |
| November 4 | 98.4% | November 5 | 82.4% |

The following statistics show the number of mills reporting by ratio groups:

| | Number of Mills Reporting—Current Weeks | | | | | |
|---|---|---|---|---|---|---|
| Ratio Limits | Sept. 30, 1939 | Oct. 7, 1939 | Oct. 14, 1939 | Oct. 21, 1939 | Oct. 28, 1939 | Nov. 4, 1939 |
| 0% to 50% | 34 | 32 | 34 | 31 | 31 | 27 |
| 51% to 100% | 271 | 273 | 269 | 264 | 244 | 174 |
| Total Mills Reporting | 305 | 305 | 303 | 295 | 275 | 201 |

PAPERBOARD OPERATING RATIOS

Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July |
|---|---|---|---|---|---|---|---|
| 1935 | 62% | 68% | 68% | 63% | 61% | 66% | 62% |
| 1936 | 62% | 67% | 67% | 70% | 69% | 70% | 69% |
| 1937 | 80% | 86% | 86% | 88% | 85% | 77% | 66% |
| 1938 | 54% | 60% | 61% | 57% | 58% | 56% | 57% |
| 1939 | 60% | 67% | 71% | 69% | 64% | 67% | 63% |

| Year | Aug. | Sept. | Oct. | Nov. | Dec. | Year Avg. |
|---|---|---|---|---|---|---|
| 1935 | 67% | 71% | 77% | 71% | 61% | 66% |
| 1936 | 75% | 78% | 82% | 80% | 74% | 72% |
| 1937 | 74% | 69% | 65% | 55% | 45% | 73% |
| 1938 | 66% | 66% | 70% | 65% | 59% | 61% |
| 1939 | 72% | 74% | ..... | ..... | ..... | ..... |

Week end. Sept. 30, 1939—82%
Week end. Oct. 7, 1939—84%
Week end. Oct. 14, 1939—83%
Week end. Oct. 21, 1939—84%
Week end. Oct. 28, 1939—85%
Week end. Nov. 4, 1939—84%

[1] Production-capacity ratios are based upon six-day capacity ratings which are adjusted periodically to correspond with the ratings reported by individual companies. Ratios are subject to revision until all reports are received.

## Selling and Burning Coal

Under the title of "How to buy, sell and burn coal", by Thomas A. Marsh, published by the author at 5625 Kenwood avenue, Chicago, Ill., at $1 a copy, the utilization and distribution of coal is discussed. The writer, who is the author of "Combustion in the power plant", covers the subject for the guidance of both technical and non-technical men who are interested in fuel.

The book includes a concise explanation of the trade opportunities in the coal industry, how to select coal for industrial and residential uses, with a description of stokers and their functions. Much useful information on service work, analysis of trouble with suggested remedies on deficient heating, etc. is included.

Other informative data are found in the chapters on testing boilers, smoke abatement, rules, and general combustion information.

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Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

# The Suitability of Red Pine for the Manufacture of Sulphite Pulp*

By John Studeny[1] and C. E. Libby[2]

## Abstract

*The present work deals with the suitability of* red pine *in sulphite pulp manufacture. It was believed that if young trees were used, the pitch troubles encountered by previous investigators could be avoided. Wood was obtained from a 23-year old plantation, and its physical and chemical properties were studied. These indicated its suitability as a paper making material. As a corroboration of previous investigations, some old red pine wood was also obtained, analyzed, and pulped.*

*Five series of sulphite cooks were made. In all cases a liquor containing 6.3 per cent total $SO_2$ and 5.00 per cent free $SO_2$ was used and the liquor-wood ratio was 6:1. The effects of temperature, liquor base, time of cooking and penetration, were studied and results tabulated.*

*It was found that young red pine wood could be delignified readily at low temperatures (135-140 deg. C.) following a two-hour penetration period. A total cooking time of ten hours proved sufficient. Yields of 45 per cent were obtained with 8-hour cooks, while 8-hr. cooks gave up to 50 per cent yields of pulp. Calcium base cooks of 10-hr. duration at 135-140 deg. C. gave the strongest, most easily bleached pulps in the best yields.*

*These pulps contained 80-85 per cent alpha-cellulose, with very little residual lignin, and a fairly low percentage of pitch. Dolomitic liquors gave "soft" pulps, which were not as strong as those made with calcium base, while soda base cooks gave very dark-colored pulps which were hard to bleach. The best pulps made from young red pine wood in these experiments, compared very well with one of the higher grades of commercial sulphites.*

*An attempt was made to pulp the older and more mature red pine wood using the same liquor and similar conditions. The yield of screenings was excessive due to the incomplete penetration of the acid liquor, caused by the high pitch content of the old wood.*

According to statistics published in 1927 *(1)*, three groups of coniferous woods, the spruces, firs and hemlocks, furnished 77.2 per cent of the total wood consumed by the U. S. pulp industry. Only twelve years ago, the pines were comparatively unimportant as pulpwood species, constituting but 7.6 per cent of the total domestic consumption at that time.

The picture has changed considerably since 1927, and last year's government statistics *(2)* revealed that the southern pines alone constituted 22 per cent of the total pulpwood consumption. Aside from the southern pines, others such as jack, white and Scots pine have been investigated and are finding some use. As the pines are inherently a faster growing species, they offer the pulp industry an attractive source of wood cellulose.

Within a relatively short span of time, a great southern pulp industry has developed, utilizing the southern pines for pulpwood. Fostered by the research of private, industrial and university laboratories, this industry has already gone far beyond the "test-tube" stage, and even the most confirmed skeptics have been forced to admit that the southern pine pulp industry is here to stay.

The northern states, too, have a pine species indigenous to this area, capable of producing a volume increment of wood cellulose per unit of land area, that compares favorably with that of the southern pines. This species, variously called red, Norway, and hard pine *(Pinus resinosa)* was studied intensively during the past year. The results of this study are given briefly in this report.

## Object of the Investigation

For many years the Department of Silviculture at the New York State College of Forestry has been interested in the silvics of red pine, a hard pine growing naturally from Nova Scotia through southern Canada as far West as S. Manitoba, and through our northern states from Massachusetts to Minnesota. In 1915, the New York State College of Forestry planted 15,000 red pine trees at its Ranger School Forest in Wanakena, N. Y., and this plantation has been thoroughly studied during the intervening 24 yr., so that a considerable amount of data is available on the plantation growth of this species.

In cooperation with the Department of Silviculture a study was made to determine the feasibility of utilizing this red pine wood for the manufacture of paper pulp. This investigation was undertaken by the Department of Pulp and Paper Manufacture at the same institution.

*Note:* An abstract of a thesis submitted in partial fulfillment of the requirements of the New York State College of Forestry, Syracuse, New York, for the degree of Master of Science.

* Presented at the Fall Meeting of the Technical Association of the Pulp and Paper Industry, Hotel Syracuse, Syracuse, N. Y., September 12-14, 1939.

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With a view primarily of aiding the pulp mills of New York state, the problem was narrowed down to the sulphite pulping of the red pine wood. Wells and Rue *(1)* have already pointed out that red pine reduces very easily by the sulphate process, producing a pulp superior to that from the southern pines. Aside from two cooks on red pine, in which the sulphite process was used, no other published data seem available on this particular phase of the problem.

The work was undertaken with a view toward producing a strong unbleached sulphite pulp from red pine, suitable particularly for newsprint sulphite, in the hope that during the progress of the research work it might be possible to determine the optimum cooking conditions for the production of an easy-bleaching grade of sulphite. It was found that red pine reduced easily by the sulphite process, *(1)* gave strong pulp in good yields, and was fairly easy to bleach. However, they stated that the uses of such pulp would be necessarily few because of the residual pitch content of the pulp. Unfortunately, they did not publish any data regarding the kind of wood used in their study, although the assumption is made that mature red pine wood was used, since experiments with old wood carried out by the present authors have corroborated the general conclusions of Wells and Rue.

Assuming that young coniferous trees are much less resinous than are the older ones (and this assumption has been repeatedly borne out by chemical analysis), it seemed possible that the use of such young trees would obviate pitch difficulties, and still produce a pulp of good quality.

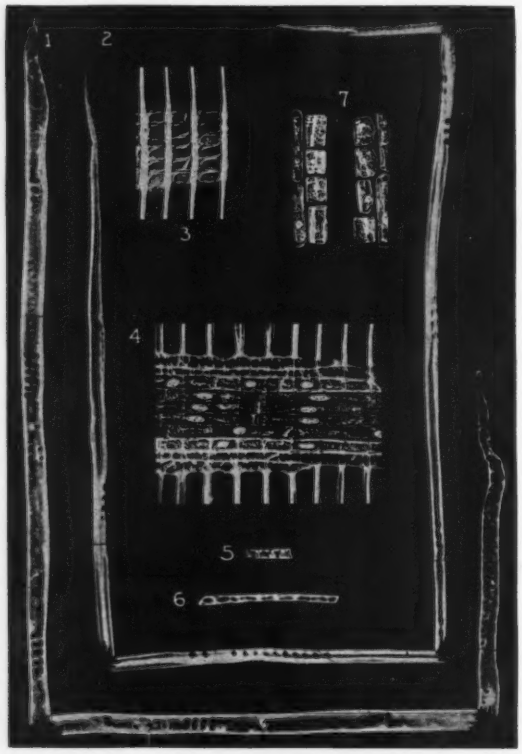


FIG. 1.

**Elements of Red Pine Wood. 1. Spring Wood tracheid (about 114×); the linear groups of large window-like pits indicate the points of contact of the tracheids and wood rays. 2. Summerwood tracheid (about 114×). 3. Lateral sectional view of a wood ray showing the window-like pits leading from ray cells to the longitudinal tracheids (152×). 4. Lateral surface view of a wood ray showing ray parenchyma and marginal dentate ray tracheids (about 152×). 5. Individual ray tracheid cell (114×). 6. Individual ray parenchyma cell (114×). 7. Epithelial cells showing grouping about the resin cavity (152×).**

## Physical and Chemical Characteristics of Red Pine

The young red pine wood used in most of the pulping experiments was obtained from a thinning operation on the New York State Ranger School Forest at Wanakena, N. Y. This 23-yr.-old wood came from trees averaging 35 ft. in height and ranging from 5 to 9 in. in diameter, breast high. The average diameter of the logs chipped was somewhat less than this figure, because all parts of the boles of the trees were utilized. The older (46 yr. of age) wood used in the experiments, was obtained from the College forest at Warrensburg, N. Y. Table I shows the physical characteristics of these two woods:

TABLE I—PHYSICAL DATA ON RED PINE WOOD

| | Ave. diam. of barked logs, in. | Ave. moisture per cent | Specific gravity as received | Density as received | Ave. ring width in. |
|---|---|---|---|---|---|
| 23-year old Red pine.... | 3.87 | 57.25 | 0.606 | 37.8 lb. per cu. ft. | 0.192 |
| 46-year old Red pine.... | 11.48 | 43.96 | 0.615 | 38.4 | 0.137 |

The size of the fiber is of considerable importance in the manufacture of paper from any pulpwood, and Table II gives a comparison betwen the fiber dimensions of red pine with those of other common pulpwoods:

TABLE II.—COMPARISON OF RED PINE FIBERS WITH THOSE OF OTHER WOODS

| Species | | Ave. fiber length, mm. | Aver. fiber width, mm. |
|---|---|---|---|
| Red pine | *(Pinus resinosa)* ..... | 3.71 | 0.035 |
| Southern pine | *(Pinus palustris)* ..... | 4.90 | 0.039 |
| | *(Pinus echinata)* ..... | 4.65 | .... |
| | *(Pinus taeda)*..... | 4.33 | .... |
| Jack pine | *(Pinus banksiana)* ..... | 2.85 | .... |
| Western hemlock | *(Tsuga heterophylla)* ..... | 2.96 | 0.031 |
| Balsam fir | *(Abies balsamea)* ..... | 3.41 | 0.032 |
| Spruces | *(Picea glauca)* ..... | 3.31 | .... |
| | *(Picea mariana)* ..... | 3.42 | .... |
| | *(Picea rubra)* ..... | 3.09 | 0.031 |
| | *(Picea sitchensis)* ..... | 3.30 | 0.040 |

It will be seen that the red pine fiber dimensions compare very favorably with all others; being somewhat shorter than the Southern pines, but longer than most of the spruces. On this basis it would seem to be a good fiber for paper making.

Fig. 1 shows some of the more important features of red pine wood. The large window pits present in the tracheids are common to the soft pines, but found also in red pine, and often used to distinguish the latter from the other domestic hard pines. The dentate (tooth-like) ray tracheids present are not found in the soft pines.

On the basis of a chemical analysis by the authors, red pine cellulose from young trees should be suitable for the manufacture of pulp, as evidenced from the comparative figures shown in Table III.

The last column clearly shows why pitch troubles are encountered when an attempt is made to pulp the older red pine wood by the sulphite process. Since this wood has a total pitch content of 9.5 per cent, an acid cooking liquor penetrates into the chips with difficulty when the ordinary sulphite pulping methods are used. However, it is evident that the young trees are not only quite low in pitch, but have other favorable properties such as a low lignin content and a fairly high cellulose content. As might be expected,

TABLE III.—COMPARISON OF CHEMICAL PROPERTIES OF RED PINE AND THE THREE LEADING PULPWOODS

| Analysis | Analyses by the U. S. Forest Products Laboratory | | | Analyses by the authors | |
|---|---|---|---|---|---|
| | Spruce per cent | W. Hemlock per cent | So. Pine per cent | 23-yr Red Pine per cent | 46-yr Red Pine per cent |
| Hot water solubility | 3.0 | 3.3 | 3.4 | 2.77 | 2.20 |
| Alcohol-Benzene solubility | 2.9 | 1.0 | 6.3 | 4.80 | 9.50 |
| Ether solubility | 1.8 | 0.3 | 4.2 | 3.28 | 8.25 |
| 1 per cent NaOH solubility | 12.5 | 13.0 | 14.5 | 14.89 | 16.65 |
| C. and B. cellulose | 60.1 | 58.6 | 58.3 | 55.90 | 52.50 |
| Lignin | 28.7 | 30.0 | 28.0 | 25.36 | 23.83 |
| Total pentosans | 13.6 | 9.1 | 11.4 | 12.51 | 9.42 |
| Ash | .. | ... | ... | 0.22 | 0.24 |

this younger wood may be delignified readily with ordinary sulphite liquors and is very easy to bleach when the proper cooking conditions are followed.

## Experimental Part

### Preparation of Chips for Cooking

The 23-yr. old red pine wood was barked by hand and cut into pieces small enough to fit the spout of the 24 in. laboratory chipper. Chips were made from pieces picked at random, including both large and small diameters. The chips were cut to a 5/8-in. length, by the proper adjustment of the chipper knives. The latter were newly sharpened for this purpose, and gave clean-cut chips. The latter were then spread out on the floor and allowed to come to equilibrium moisture content with the air. After screening by hand on a small 1/4-in. mesh screen, the sawdust and knots were rejected. The chips were stored in air-tight drums until used.

### Method of Pulping

Two experimental stainless steel sulphite digesters, each having a wood capacity of ten pounds were used. These are shown in Figs. 2 and 3.

Each digester has a complete heating system and liquor circulating pulp. The liquor was heated indirectly through a hot oil heat exchanger, and circulated through a stainless steel system consisting of a centrifugal pump and piping. The oil heat exchangers were fed by a high viscosity oil heated to the required temperature in heating coils equipped with gas burners. The temperature was usually kept at 250 deg. C. in

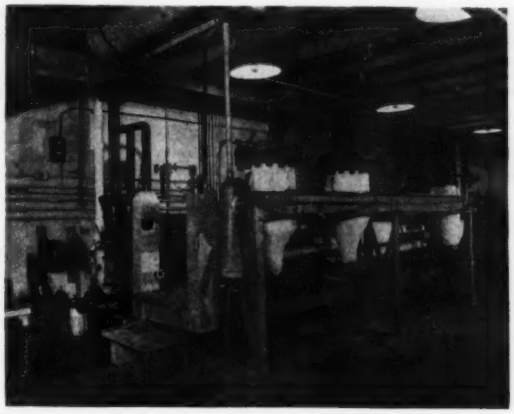

Fig. 3.

the oil system. A thermo-regulator inserted in the oil line maintained the temperature at this point. A separate motor-driven oil pump circulated the hot oil through the heat exchangers. The following method of operation was used:

*Starting the Oil System:* A small 1/4-in. steam line around the oil pump was turned on, and about 15 min. were allowed for this to heat up the oil inside the pump. The gas valve above the thermo-regulator was opened and the burners turned on. A low flame was used at first so as not to carbonize the oil in the pipes. The valve connecting the discharge side of the oil pump to the oil reservoir was closed, and the valve connecting the suction side of the pump to the reservoir was opened. The liquor circulating pump was then started, and the temperature of the oil brought up to 250 deg. C.

*Charging the Digester and Starting the Cook:* Pulp gaskets were cut to fit the top and bottom flanges of the digester. The bottom cover was securely bolted on, and all valves on the circulating pumps and liquor lines were closed. The weighed charge of chips, 3000 g. on an oven-dry basis, was introduced into the digester through the top, and a stainless steel perforated plate was then put on, with another moist pulp gasket

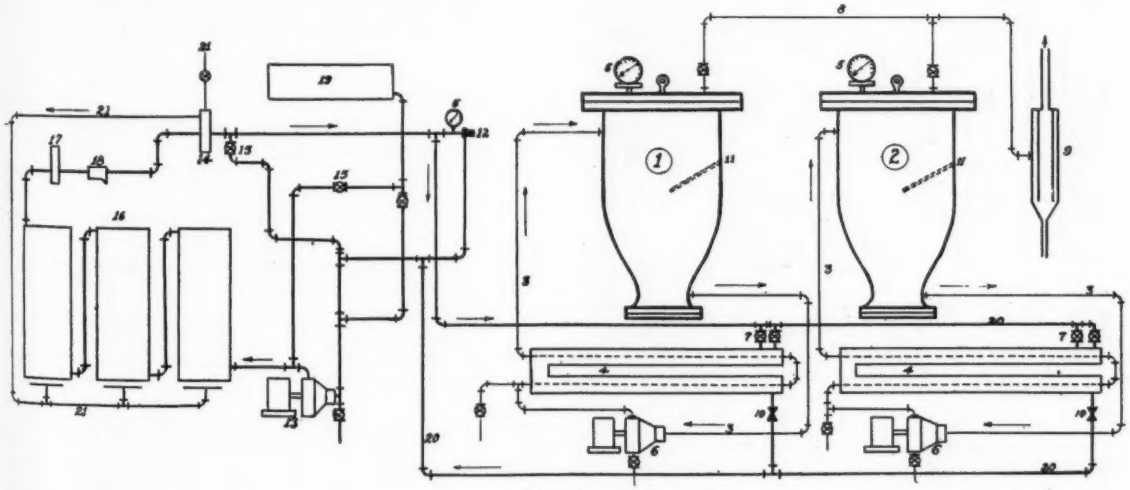

Fig. 2.

Experimental Digester Heating System. 1. Digester No. 1. 2. Digester No. 2. 3. Liquor line. 4. Oil heat exch'ger. 5. Pressure gage. 6. Liquor pump. 7. Oil reg. valves. 8. Relief line. 9. Trap. 10. Check valve. 11. Thermometer Well. 12. Pressure relief valve. 13. Oil pump. 14. Thermo gas reg. valve. 15. By pass. 16. Oil heaters. 17. Thermometer. 18. Oil strainer. 19 Oil reservoir. 20. Oil line. 21. Gas line.

in place. The relief valves were closed, and the gas relief lines connected. The liquor circulating pumps were then started and the digestion begun in both digesters. It was generally possible and advantageous to run two cooks at a time.

*The Cook:* The oil regulating valves, admitting the hot oil to the heat exchangers, were then opened, and the temperature raised according to a predetermined temperature schedule. With care, it was possible to adjust these valves so as to follow any given temperature schedule to within 0.5 deg. C. The relief valve was used to maintain the pressure schedule, and the temperature was observed on a thermometer set in a well inside the digester. At the conclusion of the cook, the pressure was blown down from maximum to zero and the hot water line was connected to each digester through the relief valve. After allowing all of the waste liquor to drain out through the pump drain valve, hot water was admitted to the digester and circulated through the contents until the effluent was clear.

*Handling the Pulp:* When washing in the digester was complete, the top and bottom covers of the digester were removed, and the pulp dumped into a container and taken to the disintegration tank. Warm water was added to the tank, and the pulp agitated until disintegration was complete, after which it was drained through a cheesecloth and pressed to about 25 per cent dry solids with a small hand press.

*Determination of Yield:* The pressed pulp cake was broken up by hand and thoroughly mixed. Triplicate moisture samples were taken after the gross weight was determined. Knowing the total weight of the pulp and its moisture content, the unscreened yield was then calculated. The pulp was screened on a small laboratory screen equipped with a single 0.010 in. cut plate. The screenings were collected and oven-dried, while the screened pulp again was pressed and treated in the same manner as the unscreened pulp for the determination of yield. The weight of the original moisture samples was included in the final yield calculations. Duplicate yield determinations insured against making large errors at this point.

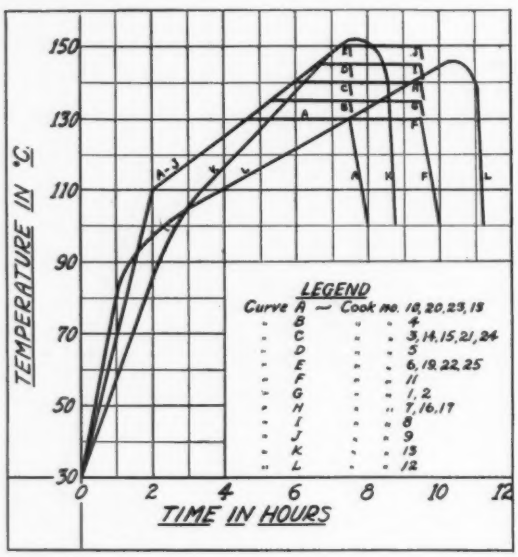


FIG. 4.

**Temperature Schedules Used in the Sulphite Pulping of Red Pine**

In all cases, the final tests and analytical procedures were carried out on this screened pulp, which was stored in air-tight cans. For chemical analyses, a small representative portion was air-dried, and shredded.

### PULPING EXPERIMENTS ON YOUNG RED PINE

The preliminary pulping experiments on young red pine wood were confined to a study of the following variables upon the resulting pulp: maximum cooking temperature; alkali base used for the liquor; cooking time; preliminary impregnation time.

The liquor used in all cooks was a high-free $SO_2$ liquor, adjusted to the following analysis: 6.30 per cent total sulphur dioxide; 5.00 per cent free sulphur dioxide; 1.30 per cent combined sulphur dioxide.

The Palmrose iodate method *(3)* was used with all cooks, for the analysis of both raw and relief liquors. A liquor ratio of 6 to 1 was used; thus for every charge of 3000 g. of chips (oven-dry basis), 18 l. of liquor having the above composition were added to the digester.

It was hoped that the "high free" liquor would be conducive to better penetration of the wood, and allow a faster temperature rise. The liquor-wood ratio was chosen so as to most nearly simulate actual industrial conditions.

Since the temperature schedule was admittedly the most important factor in sulphite pulping, arbitrary curves were designed to show the optimum temperature conditions for the pulping of the red pine wood. Miller and Swanson *(4)* in their researches on the sulphite process drew certain conclusions that served as a guide in the selection of cooking conditions. These may be summarized as follows:

The preliminary heating period should be long enough to secure complete penetration and as short as is consistent with uniform penetration, two hours being a good average.

The maximum temperature should be as low as is consistent with the time available for cooking; temperatures in excess of 150 deg. C. are inadvisable owing to the low content of free sulphurous acid in the liquor at this point.

For high yields of strong pulp, the temperature should be raised from the critical point to the maximum at a uniform rate or preferably allowed to follow an upward curve gradually increasing in steepness as the maximum is approached.

To obtain high yields of strong bleached pulp in limited time, the temperature should be raised to the maximum in about 1½ hr. before the end of the cook. During the last 1½ hours, the maximum temperature should be maintained.

Fig. 4 shows the final cooking schedules adopted in the present study. Curves A through J were arbitrarily selected to cover a range of 20 deg. from a low point of 130 deg. C. to a high point of 150 deg. C. Curves K and L were taken from actual mill curves of two typical sulphite mills cooking a newsprint grade of sulphite. The two latter curves allow a much longer penetration time, thus causing a marked increase in the total cooking. In the present study, the cooking periods were 8 and 10 hr., regardless of the condition of the liquor at those points. This was done in order to change one variable factor at a time, thus allowing intercomparison of results, as affected by single variables.

The pulps obtained from young red pine wood were tested by the standard methods usually used in determining the physical and chemical characteristics in the United States. The following methods were selected:

Yield determinations were made as previously described.

Beater strength tests were made according to TAPPI standard T 200m-34.

Bursting strength tests were made according to TAPPI standard T 403m-36.

Tearing strength tests were made according to TAPPI standard T 414m-35.

Folding endurance tests were made according to TAPPI standard T 423m-36.

Bleachability was determined by a single stage hypochlorite bleach method called the "Excess Chemical Method" as used at the pulp and

paper laboratory of the New York State College of Forestry. The "bleachability" as recorded in the tables refers to the per cent of chlorine on the basis of oven-dry pulp, that is required to give an 80 per cent brightness on the Higgins photoelectric colorimeter.

Alpha cellulose, lignin and ash were determined by TAPPI standard T 203m-36.

Pitch (alcohol and ether solubility) was determined by TAPPI standard T 204m-35.

1 per cent NaOH solubility were made according to TAPPI standard T 212m-36.

Freeness was determined by the Canadian standard freeness tester, using a 0.3 per cent consistency at 20 deg. C., and the results recorded in cc.

Ten cooks were run in the first series to study the effect of temperature. Five cooks were made with a cooking time of 8 hr., and five with a cook of 10 hr. duration. The results are shown in Tables IV and V.

In order to compare the results obtained with red pine, utilizing curves which were arbitrarily selected, with the results obtainable from the same wood by using commercial methods of cooking, two additional cooks simulating mill conditions were carried out. Cook no. 13 extended over 8¾ hr., reaching a maximum temperature of 151 deg. C. according to curve K in Fig. 4. Cook no. 12 was an 11-hr. cook with a maximum temperature of 145 deg. C., as shown by curve L.

## Discussion of Series A and B Cooks

In the first two sets of cooks on young red pine, the effects of maximum temperature and cooking time upon the yields of pulp, and the physical and chemical quality, were determined. Series A was run for 8 hr. with a standard calcium base liquor as previously outlined. From the results, which are charted in Table IV, it is evident that the yield of pulp decreased steadily as the maximum temperature increased. The physical strength of the pulps resulting from the cooks made at 130 and 135 deg. C. was very high, but the pulps were definitely "raw" as evidenced by the high lignin content and the resulting bleach consumption. The optimum cook for the 8-hr. series seems to be either at 140 or 145 deg. C., and at these temperatures the best yields of usable pulp were obtained. The ether solubility of the pulps from these two cooks was low, and since this factor is supposed to be a measure of pitch trouble, the results were considered satisfactory. However, the ash content was unduly high, indicating a considerable amount of precipitation of the lime in the liquor. This fact is especially true for the 145 deg. C. cook, where the ash content rose to 1.4 per cent. Such a high ash content is obviously due to liming out, and is quite understandable in view of the fact that a considerable amount of free $SO_2$ must be relieved in order to get the temperature to this point. This relief necessarily disturbs the equilibrium in the liquor, with resulting precipitation of the calcium monosulphite. Despite the fact that a strong pulp was obtained by 8-hr. cooks, it was not possible, (as indicated by the tables) to obtain a sufficient degree of chemical purification to give a pulp that would be *unquestionably* suitable for commercial use, although any of the above pulps might easily be used where color and purity are not of prime importance.

Series B cooks, run at 10 hr. with the same liquor gave markedly different results, as shown in Table V. The longer cooks gave a far greater degree of delignification than did the 8-hr. cooks, and at a lower temperature. Where 140-145 deg. C. was required for an 8-hr. cook to produce the best pulp, the 10-hr. cooks gave very strong and pure pulps at 135-140 deg. C. The 140 deg. C. cook was probably the best one, giving a high yield of easily bleached pulp that developed a very high bursting and tearing strength in the beater. This cook is in sharp contrast with those carried out at the higher temperatures, for the latter resulted in soft pulps that did not develop any strength whatsoever in the beater. Apparently these last two cooks at 145 and 150 deg. C., were slightly burned, since visual examination revealed that the fiber had a coarse, burnt appearance, and furthermore an odor persisted even after several washings. It is evidently very difficult to maintain any free sulphur dioxide in the digester when cooking for long periods of time at high temperatures such as these.

Summarizing the results of the first ten cooks, it may be said that the best pulps from young red pine are obtainable when cooking at a low temperature (135-140 deg. C.) for about 10 hours. These conditions result in a maximum degree of purification with very little loss in strength. At these temperatures, it is possible to recover large amounts of sulphur dioxide from the relief, and it should be fairly easy to follow such cooking conditions in commercial digesters. The pulps resulting from this type of cook are high in alpha-cellulose, remarkably easy to bleach, and contain an amount of pitch in the unbleached

TABLE IV.—EFFECT OF TEMPERATURE ON THE PHYSICAL AND CHEMICAL PROPERTIES OF PULP FROM YOUNG RED PINE

Time: 8 hr.
Max. pressure: 75 lb. per sq. in.
Liquor: calcium base

| Series A — Conditions: | | | | | |
|---|---|---|---|---|---|
| Cook number | 10 | 4 | 3 | 5 | 6 |
| Curve | A | B | C | D | E |
| Maximum temperature, deg C. | 130 | 135 | 140 | 145 | 150 |
| Unscreened yield, per cent | 55.6 | 54.8 | 51.0 | 50.5 | 50.9 |
| Screened yield, per cent | 50.5 | 47.3 | 45.8 | 47.8 | 46.4 |
| Screenings, per cent | 5.3 | 3.9 | 3.4 | 2.9 | 3.4 |
| *Tests on beaten pulp:* | | | | | |
| Time to 100 cc. freeness, min. | 35 | 48 | 46 | 59 | 50 |
| Burst factor at 100 cc. freeness, per cent | 102 | 103 | 95 | 97 | 88 |
| Tear factor at 100 cc. freeness | 0.50 | 0.73 | 0.66 | 0.98 | 0.80 |
| Fold at 100 cc. freeness | 1250 | 1150 | 1450 | 1400 | 1650 |
| Initial brightness, per cent | 46.6 | 56.1 | 51.4 | 56.0 | 56.1 |
| Bleachability, per cent | 22.33 | 17.58 | 16.85 | 10.45 | 10.17 |
| Lignin in pulp, per cent | 7.65 | 4.90 | 5.28 | 3.76 | 3.16 |
| Alpha cellulose in pulp, per cent | 74.10 | 76.20 | 77.27 | 78.49 | 78.35 |
| Ether solubility, per cent | 1.04 | 0.92 | 0.70 | 0.84 | 1.01 |
| Alcohol solubility, per cent | 2.29 | 2.01 | 2.10 | 2.13 | 2.47 |
| 1 per cent NaOH solubility, per cent | 12.03 | 13.68 | 11.77 | 12.58 | 12.37 |
| Ash, per cent | 9.92 | 0.90 | 1.14 | 1.37 | 1.67 |

*Note:* All percentages based on oven-dry pulp except yield figures which are based on oven-dry wood.

TABLE V.—EFFECT OF TEMPERATURE ON THE PHYSICAL AND CHEMICAL PROPERTIES OF PULP FROM YOUNG RED PINE

Time 10 hr.
Max. pressure: 75 lb. per sq. in.
Liquor: Ca base

| Series B — Conditions: | | | | | |
|---|---|---|---|---|---|
| Cook number | 11 | 1 and 2 | 7 | 8 | 9 |
| Curve | F | G | H | I | J |
| Maximum temperature, deg. C. | 130 | 135 | 140 | 145 | 150 |
| Unscreened yield, per cent | 51.8 | 49.0 | 48.6 | 44.3 | 45.7 |
| Screen yield, per cent | 46.5 | 43.0 | 44.0 | 39.0 | 43.4 |
| Screenings, per cent | 3.3 | 2.8 | 3.7 | 1.7 | 1.0 |
| *Tests on beaten pulp:* | | | | | |
| Time to 100 cc. freeness. min. | 52 | 47 | 59 | 61 | 65 |
| Burst factor at 100 cc. freeness, per cent | 108 | 95 | 97 | 69 | 71 |
| Tear factor at 100 cc. freeness | 0.65 | 0.83 | 1.00 | 0.65 | 0.76 |
| Fold at 100 cc. freeness | 1800 | 2100 | 1170 | 350 | 350 |
| Initial brightness, per cent | 47.8 | 55.3 | 63.4 | 53.4 | 59.5 |
| Bleachability, per cent | 15.02 | 8.05 | 5.47 | 7.60 | 5.98 |
| Lignin in pulp, per cent | 3.67 | 2.01 | 1.46 | 1.13 | 0.84 |
| Alpha cellulose in pulp, per cent | 77.53 | 81.32 | 80.94 | 84.92 | 83.96 |
| Ether solubility, per cent | 1.50 | 1.55 | 1.73 | 3.36 | 2.49 |
| Alcohol solubility, per cent | 2.06 | 2.90 | 2.68 | 3.41 | 3.16 |
| 1 per cent NaOH solubility, per cent | 10.90 | 12.34 | 11.87 | 13.60 | 13.33 |
| Ash, per cent | 0.85 | 0.58 | 0.75 | 0.56 | 0.70 |

state that would probably not hinder their use in newsprint and sulphite specialties where unbleached pulp is used.

### Series C Cooks

In order to determine whether commercial cooks, such as are used in New York state mills, would be satisfactory to use in pulping red pine, two typical mill curves were selected. These curves are shown in Fig. 4, K. and L. Cook no. 12, in this series, was an 11-hr. cook allowing 4 hr. for penetration. Cook no. 13 was an 8¾ hr. cook with 3½ hr. allowed for the initial penetration period. These curves both allow more time for penetration, since our standard curves all had a uniform penetration time of 2 hr. to 110 deg. C., prior to pulping.

It is interesting to note the properties of the pulps obtained by cooking with these commercial curves. Table VI shows the complete physical and chemical data for these cooks. The screened yields were almost the same in spite of the difference in cooking time, although, as would be expected, the shorter cook gave a somewhat higher percentage of screenings. However, the pulps in both cooks failed to develop the high physical strength shown by the experimental cooks which followed the arbitrary cooking schedules. The bleachability was higher, and the original color was not as great. Apparently the commercial conditions were more favorable in at least two respects, however, in that they gave lower pitch and ash contents.

Taking all factors into consideration, the 140 deg. C. cook (10 hr.) made according to our own curves was the best one as far as yield, strength, and chemical purity were concerned. The commercial cooks with their longer periods of penetration do not produce appreciably better pulps so the assumption that 2 hr. of penetration is sufficient is probably justified.

On the whole, our cooking experiments proved that red pine is very easily pulped, and that a high-free sulphur dioxide liquor will penetrate the wood very rapidly.

### Series D Cooks

Having determined the optimum temperature and the time to use in producing the best pulp from young red pine, another variable, that of the effect of liquor base, was studied. In order to keep all factors, except base, constant the series D cooks were run at 75 pounds pressure for 8 hr. and 10 hr. at 140 deg. C. maximum temperature, according to curves C and H in Fig. 4. The same liquor strength was used as

TABLE VI—RESULTS SHOWING THE USE OF COMMERCIAL TEMPERATURE SCHEDULES IN THE PULPING OF YOUNG RED PINE

| Series C. | Conditions: | Cook No. 12 | Cook No. 13 |
|---|---|---|---|
| | Cooking time: | 11 hr. | 8¾ hr. |
| | Max. pressure: | 75 lb. per sq. in. | 75 lb. per sq. in. |
| | Max. temperature: | 145 deg. C. | 151 deg. C. |
| | Penetration time: | 4 hr. | 3½ hr. |
| | Liquor: | Ca base | Ca base |
| Curve number | | L | K |
| Unscreened yield, per cent | | 49.3 | 53.3 |
| Screened yield, per cent | | 46.5 | 46.8 |
| Screenings, per cent | | 2.2 | 4.1 |
| *Tests on beaten pulp:* | | | |
| Time to 100 cc. freeness, min. | | 33 | 33 |
| Burst factor at 100 cc. freeness, per cent | | 92 | 90 |
| Tear factor at 100 cc. freeness | | 0.70 | 0.68 |
| Fold at 100 cc. freeness | | 1660 | 1250 |
| Initial brightness, per cent | | 51.2 | 50.1 |
| Bleachability, per cent | | 8.12 | 10.83 |
| Lignin in pulp, per cent | | 1.47 | 3.21 |
| Alpha cellulose in pulp, per cent | | 80.53 | 79.29 |
| Ether solubility, per cent | | 1.09 | 0.99 |
| Alcohol solubility, per cent | | 2.03 | 2.24 |
| 1 per cent NaOH solubility, per cent | | 10.4 | 10.45 |
| Ash, per cent | | 0.60 | 0.68 |

TABLE VII.—EFFECT OF LIQUOR BASE UPON THE PHYSICAL AND CHEMICAL PROPERTIES OF PULP FROM YOUNG RED PINE WOOD

Series D Conditions: Max. temperature: 140 deg. C. Max. pressure: 75 lb. per sq. in.

| Cook number | 3 | 14 | 15 | 7 | 16 | 17 |
|---|---|---|---|---|---|---|
| Curve | C | C | C | H | H | H |
| Liquor base | Ca | Na | Ca-Mg | Ca | Na | Ca-Mg |
| Cooking time (hours) | 8 | 8 | 8 | 10 | 10 | 10 |
| Unscreened yield, per cent | 51.0 | 50.4 | 52.4 | 48.6 | 46.2 | 47.2 |
| Screened yield, per cent | 45.8 | 48.5 | 46.1 | 44.0 | 44.0 | 44.1 |
| Screenings, per cent | 3.4 | 1.8 | 3.5 | 3.7 | 0.8 | 2.1 |
| *Tests on beaten pulp:* | | | | | | |
| Time to 100 cc. freeness, min. | 46 | 23 | 24 | 59 | 36 | 32 |
| Burst factor at 100 cc. freeness, per cent | 95 | 92 | 85 | 97 | 91 | 87 |
| Tear factor at 100 cc. freeness | 0.66 | 0.71 | 0.61 | 1.00 | 0.75 | 0.72 |
| Fold at 100 cc. freeness | 1450 | 1100 | 1125 | 1170 | 1170 | 1020 |
| Initial brightness, per cent | 51.4 | 46.8 | 51.9 | 63.4 | 49.2 | 54.2 |
| Bleachability, per cent | 16.85 | 14.4 | 12.0 | 5.47 | 8.5 | 4.6 |
| Lignin in pulp, per cent | 5.28 | 2.70 | 2.80 | 1.46 | 0.70 | 1.18 |
| Alpha cellulose, per cent | 77.27 | 79.75 | 79.4 | 80.94 | 83.02 | 82 55 |
| Ether solubility, per cent | 0.70 | 0.99 | 1.07 | 1.73 | 1.49 | 1.45 |
| Alcohol solubility, per cent | 2.10 | 1.46 | 1.26 | 2.68 | 1.57 | 1.40 |
| 1 per cent NaOH solubility, per cent | 11.77 | 11.90 | 11.60 | 11.87 | 10.85 | 11.20 |
| Ash, per cent | 1.14 | 0.69 | 0.66 | 0.75 | 0.45 | 0.44 |

in all previous cooks, except that the base was changed. Sodium and mixed dolomite bases were used. The latter base was obtained by using a lime containing 37.94 per cent MgO and 59.32 per cent CaO by analysis. The soda base liquor was made from ordinary C.P. NaOH. In every case the final analysis was adjusted to the same total sulphur dioxide content of 6.30 per cent and 5.00 per cent free $SO_2$. The results of this series are shown in Table VII and are compared with the previous cooks run at the same conditions with calcium base in the liquor.

From Table VII it is evident that cooks made with calcium base give a physically stronger pulp than either of those made with soda or dolomite base. The differences in yield using the various bases are slight, but the chemical purity of the pulps are notably different, the soda base giving the highest alpha celulose content and lowest lignin residue. Contrary to original expectations, however, the soda base cooks gave pulps that were hard to bleach despite the low percentage of lignin remaining in the pulp. The original color of the pulp made with soda base had a brown shade, not unlike that of a slightly burned cook. In this regard, the cooks made with dolomitic liquor always gave the most easily bleached pulps, and containing the least amount of pitch. The latter cooks are also much more practicable commercially, since it would be quite impractical to use soda base in commercial sulphite pulping unless it were possible to recover the soda, or make a pulp that commanded a high enough price, because of some special quality. Furthermore, the difference in chemical purity of pulps cooked with soda and dolomitic base is so small that the latter would be preferable.

TABLE VIII.—COMPARISON OF PULP FROM YOUNG RED PINE WOOD WITH A HIGH GRADE COMMERCIAL NEWSPRINT SULPHITE PULP

| | Commercial pulp | RP No. 7 | RP No.17 |
|---|---|---|---|
| Beating time required to 100 cc. freeness, min. | 50 | 59 | 32 |
| Burst factor at 100 cc. freeness, per cent | 110 | 97 | 87 |
| Tear factor at 100 cc. freeness | 1.23 | 1.00 | 0.72 |
| Fold at 100 cc. freeness | 1931 | 1170 | 1020 |
| Initial brightness, per cent | 52.8 | 63.4 | 54.2 |
| Bleachability, per cent | 5.66 | 5.47 | 4.60 |
| Lignin in pulp, per cent | 0.95 | 1.46 | 1.18 |
| Alpha cellulose, per cent | 86.70 | 80.94 | 82.55 |
| Ether solubility, per cent | none | 1.73 | 1.40 |
| Alcohol solubility, per cent | none | 2.68 | 1.40 |
| 1 per cent NaOH solubility, per cent | 9.70 | 11.87 | 11.20 |
| Ash, per cent | 0.34 | 0.75 | 0.44 |

In completing the study of the sulphite pulping of young red pine wood, a comparison was made between the pulps from two of the better cooks made in

this study, and a typical commercial newsprint sulphite pulp. The latter was made from western hemlock wood, notably free of resin and containing a high percentage of cellulose in the woody tissues. Table VIII gives comparison of properties. It is to be noted that the red pine pulps compare rather favorably considering the difference in the original chemical composition of the red pine and Western hemlock woods.

## Summary

SULPHITE PULPING OF YOUNG RED PINE:

Young red pine wood does not contain too large an amount of pitch to obviate its use for sulphite pulp.

The chemical and physical properties of young red pine indicate that it is admirably suitable for the manufacture of sulphite pulp.

The wood is easily reduced by the sulphite process, at temperatures of 135-140 deg. C., a 2-hr. penetration period being sufficient.

Cooking with calcium base liquor containing a high free sulphur dioxide content, for 10 hr., produces a strong, easily bleached pulp containing 80-85 per cent alpha-cellulose and about 1.5 per cent lignin.

Yields of about 45 per cent are obtainable with 10-hr. cooks, while the shorter 8-hr. cooks give somewhat higher yields of less pure pulp.

Softer pulps, suitable for bleaching and subsequent use when strength is not a primary requisite, may be prepared by using dolomitic liquors.

Soda base liquors give dark colored pulps which are harder to bleach than either those prepared with calcium or dolomitic base liquors. Although the alpha cellulose content is slightly higher in such pulps, these liquors appear commercially impractical.

Pitch content of pulps may be reduced to a very small percentage by cooking for 8 hr. with dolomitic base liquor, at 140 deg. C. maximum temperature.

Pulps cooked by 8-hr. schedules always have less residual pitch than those made with 10-hour cooks.

Existing commercial methods of sulphite pulping, now applied to other woods, can be used with red pine, although curves developed in this work lead to pulps of better quality as regards physical strength and chemical purity.

Pulp from red pine compares favorably with the best grades of newsprint sulphite.

SERIES E COOKS—PULPING OF MATURE RED PINE WOOD:

In order to corroborate, if possible, the previously mentioned results of Wells and Rue *(1)*, six cooks were made using liquors similar to those employed in the cooks used in pulping the young wood. The complete results of this series are shown in Table IX.

In studying the tabulated results, it is apparent that some difficulty was experienced in the pulping of the mature wood. The first conclusion drawn was that the acid liquor used could not penetrate the older, more pitchy wood in the 2 hr. allowed. This explains in every single case why a very high yield of screenings was obtained. Upon examination, it was found that these screenings were always made up of "burned cores," indicating incomplete penetration before reaching the critical pulping temperature. The screened pulp using the calcium base cooks was very strong, but hard to bleach. The pulp prepared with dolomitic liquor was somewhat weaker physically, and equally difficult to bleach. In every cook, the pulp was extremely pitchy to the touch, and the pitch clung to the sides of the beater during the physical tests. Ten-hour cooks were not made, since it was felt that little could be gained in this procedure.

Obviously, the only possibility in pulping the mature red pine wood, would be to allow a longer period of penetration through the use of high initial hydrostatic pressures. Such a procedure, together with the proper temperature schedule, might result in a usable pulp. However, it seems unlikely that the mature wood can be used commercially with any degree of success.

SULPHITE PULPING OF MATURE RED PINE:

The high pitch content of the mature red pine, prohibits its use for sulphite pulp, under the conditions used in this work.

Pulp prepared from mature wood contained a very large amount of pitch and probably large amounts of residual lignin.

While strong physically, the pulp obtained in all cooks was very hard to bleach.

A pronounced tendency to redden after standing overnight, was observed on the pulps prepared from mature red pine. Whether this has any connection with the high pitch content is not known, but the reddening tendency was much higher than with pulps from the young wood.

While young red pine was easily delignified at 135-140 deg. C., the temperature necessary to give the best pulp with the mature wood was 150 deg. C.

TABLE IX.—EFFECT OF COOKING TEMPERATURE AND LIQUOR BASE ON THE PROPERTIES OF PULP FROM OLD RED PINE

Conditions: Max. pressure: 75 lb. per sq. in. Cooking time: 8 hr.

| Series E | | | | | | |
|---|---|---|---|---|---|---|
| Cook number | 20 | 21 | 22 | 23 | 24 | 25 |
| Curve ..... | A | C | E | A | C | E |
| Max. temperature, deg. C. | 130 | 140 | 150 | 130 | 140 | 150 |
| Liquor base... | Ca | Ca | Ca | Ca-Mg | Ca-Mg | Ca-Mg |
| Unscreened yield, per cent | 61.3 | 57.2 | 57.8 | 60.2 | 55.9 | 57.5 |
| Screened yield, per cent.... | 44.6 | 43.4 | 44.7 | 45.5 | 46.4 | 42.9 |
| Screenings, per cent ..... | 14.8 | 11.4 | 9.1 | 13.8 | 8.1 | 10.2 |
| Tests on beaten pulp: | | | | | | |
| Time to 100 cc. freeness, min. ..... | 100 | 163 | 190 + | 45 | 65 | 250 + |
| Burst factor at 100 cc. freeness, per cent ..... | 90 | 100 | 113 | 89 | 90.6 | 100 + |
| Tear factor at 100 cc. freeness .. | .80 | .82 | 1.10+ | .75 | .95 | 1.00+ |
| Fold at 100 cc. freeness | 1600 | 2300 | 2000 + | 1325 | 1414 | 1700 + |
| Initial brightness, per cent | 49.5 | 56 | 56 | 47.5 | 52.5 | 58.7 |
| Bleachability, per cent... | 25.0 | 12.0 | 12.8 | 25.0 | 17.0 | 12.7 |

## Literature Cited

(1) Wells, S. D., and Rue, J. D. U. S. Department of Agriculture *Bull.* 1485 (1927).
(2) U. S. Tariff Commission report to U. S. Senate on wood pulp and pulpwood. *Rept.* 126, 2nd series, page 249.
(3) Palmrose, G. V. *Paper Trade J.* 100, no. 3:38-39 (Jan. 17, 1935); *Tech. Assoc. Papers* 18 (June 1938).
(4) Miller and Swanson. "Chemistry of the Sulphite Process", pages 113-116, New York, Technical Association of the Pulp and Paper Industry, Lockwood, New York, 1928.

## Acknowledgments

In Table II, the figures were furnished by C. C. Forsaith, Department of Wood Technology, New York State College of Forestry, Syracuse, N. Y. Fig. 1 was furnished by H. P. Brown and W. M. Harlow, Department of Wood Technology, New York State College of Forestry, Syracuse, N. Y.

In Table III, part of the figures were supplied by W. M. Harlow.

# Planted Red Pine As Related To Pulpwood Yields North and South*

By E. F. McCarthy[1]


## Abstract

*An average growth of 100 cu. ft. of wood per acre per year has been obtained in red pine (Pinus Resinosa Ait.) plantations during the first 25 yr., and with attention to thinning to maintain maximum this rate can be doubled. Studies of plantations show severe reduction in growth of 6 ft. by 6 ft. plantations both in height and diameter, beginning at 17 yr. after planting. Even dominant trees decreased from 0.45 cu. ft. of growth per tree to 0.34 cubic foot. Early thinnings to the extent of 5 cords per acre can be removed without expectation of profit, solely for the benefit of the remaining stand. The larger trees at 25 yr. of age will be 10 in. in diam. and 40 ft. or more in height.*

*Yields per acre will compare favorably with those of southern pine, due to the greater density of stand. Even with equal amounts of precipitation, the northern site benefits because of snow cover and a shorter season of high temperatures and consequent drying of soil.*

*Good coordination of effort will permit cheap production of pulpwood while profit is accrued on the hand-pruned trees retained for saw lumber.*


## Establishment of Plantations

The experience of more than thirty years with plantations established in this State makes possible at this time a reasonably accurate estimate of the relative value of species for plantation purposes. In planting idle land, both private individuals and the State itself have used principally softwoods successfully. Coniferous trees have proved easier to plant and establish, and they also supply a need in the State where the natural forest is largely made up of hardwood trees.

Beyond the selection of softwood stock for planting, there was a general lack of foresight in the selection of the species. It seemed desirable to produce saw timber, and those who looked forward to the production of pulpwood naturally believed that the spruces offered the best possibility. European species were selected, particularly Norway spruce and Scotch pine, because seeds were easily obtained and both these species had proved suitable for planting in the northeast. Our native white pine and European larch were early favorite selections. Red or Norway pine was not much used at first because of the difficulty of obtaining a seed supply. This difficulty has remained with us, as indicated by the higher cost of red pine seeds. However, the State Conservation Department began to grow this species early in its program so that planted stands more than thirty years old are now available for study. Some of these stands have been remeasured in preparation for this meeting and the results are presented to you.

One of the oldest plantations of red pine is located on the property of the Great Bear Springs Company between Fulton and Phoenix, N. Y., Fig. 1. This plantation was established in 1909 and consecutive measurements have been made in it at intervals. The last measurement made in June of this year shows that this stand, now in its thirty-first year of growth since planting, contains 4329 cu. ft. of wood. This includes the total volume of wood in the area without bark. In the 5-yr. period previous to 1937 this stand grew at the rate of 302 cu. ft. per acre per year. The average annual increment throughout its entire life is about 140 cubic feet. This, of course, includes the years when the trees were very small and were not completely occupying the area. The average live crown length has been reduced by crowding to 36 per cent of the total height. Height growth has slowed down so that additional length of live crowns is not gained as fast as it is lost by death of limbs at the base. The trees which now average 47 ft. in height are too slender; they sway in the wind and will soon fail to occupy the full area because of whipping.

Another stand of timber was measured at York,

*Photo by J. E. Phillips*

FIG. 1.

Red pine on land of the Great Bear Springs Company. Average growth more than 1½ cords per acre per year.

* Presented at the Fall Meeting of the Technical Association of the Pulp and Paper Industry, Hotel Syracuse, Syracuse, N. Y., Sept. 12-14, 1939.

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FIG. 2.
Red pine on the N. Y. State Ranger School Forest-Planted 1915—Total volume of 26 cords in 23 years.

Pa., on the property of the York Water Company. This plantation was established in 1914, has been remeasured at intervals, and in 1939 contained 3364 cu. ft. of wood produced in 26 growing seasons. This is about equal to the rate shown by the Great Bear Springs plantation as indicated by the mean annual increment. This stand grew at one time at the rate of 230 cu. ft. per acre per year but during the past 10 yr. has averaged only 162 cu. ft. per acre, showing thereby that it has begun to stagnate.

In 1915, the students of the New York State Ranger School at Wanakena, N. Y., Fig. 2, in the western Adirondacks planted 15 acres of red pine on the forest property attached to the school. This land had been cut over for all merchantable material and burned subsequently in the year 1908. Seven years had elapsed between the fire and the planting. The trees were planted about 6 ft. apart with a mattock without other preparation of the site. For the first 3 yr. the young trees were completely covered in a growth of red raspberry bushes, fire weed, and some bracken fern. The stand received no subsequent care until 1927 when a small amount of voluntary growth of hardwoods was removed. On the advent of the Civilian Conservation Corps' program the trees were pruned to a height of about 16 ft., but no thinning was done until 1938.

### Comparative Growth Data

This plantation has been completely successful except where destroyed by frost in the lower lying lands. Planting was done with $4 stock on $2 land with two man-days per acre labor charge. The average volume found in this plantation in 1938 was 2300 cu. ft. without bark. The trees are very sturdy in form and 35 to 40 ft. high. The largest diameter is about 10 in.; the average diameter about 6 in. As in the case of the Great Bear Springs and York plantations, these trees have made a better annual increment in the past than they are making at the present time. Crowding, due to too great density, began at about 17 yr. of age. A detailed study was made of 100 dominant trees which showed a definite decrease in height growth during the last 4 yr. and a decrease in rate of diameter growth during the last 7 to 8 years.

Comparison can be made with production of wood in the south by reference to the growth and yield studies furnished by the United States Forest Service. In the study of yield of southern pines only the best natural growth stands were selected, that is, those which showed complete stocking. It would probably have been difficult to secure an equal number of plots elsewhere in the south which would show as good a yield as those used in making the yield tables. Any attempt to make comparisons with the average second growth stands of the south would show them far below the yields contained in the published yield tables. In making this comparison the quality of the site must be taken into consideration. Since there is nothing extraordinary in the character of the land on which the three plantations cited are grown, the average site in each of the southern pines has been selected. This is indicated in the yield tables on the basis of number of feet of height at 50 yr. of age. The table shows, therefore, the species, the site-index class, and the volume in cubic feet per acre at 30 yr. of age. This early age is used because it is the age of the red pine stands cited.

| Species | Age | Site-index | Total volume cu. ft. |
|---|---|---|---|
| Loblolly pine | 30 | 90 | 3850 |
| Longleaf pine | 30 | 80 | 2850 |
| Shortleaf pine | 30 | 70 | 3120 |
| Slash pine | 30 | 80 | 3750 |

These records clearly show that the best natural stands of pine in the south will furnish a yield per acre quite comparable to that of our northern red pine, in spite of the fact that the growing season is longer and the temperatures higher. The rainfall may be slightly greater than the average of that of the northeast. We do not question the ability of the individual trees to grow at a greater rate than the red pine in the northeast, but the yield per acre is influenced by the amount of available soil moisture which in turn is depleted seriously by the longer growing season with higher temperatures. This results very definitely in a lesser number of trees per acre. This same factor was noted in studies of yield of yellow poplar in the Blue Ridge Mountains of Georgia, where the volume growth was not equivalent to similar sites in Maryland.

The mean average growth rate of all natural stands of timber begins to slow down in early life. There is no doubt that we can obtain growth rates of more than 250 cu. ft. per acre per year with planted stands of red pine but this will not persist long unless thinnings are made early in the life of the stand. You have observed from Figs. 3 and 4 red pine slows down its rate of growth in both height and diameter under 20 yr. of age. The cure for this is to give the individual trees more room by thinning and salvaging those thinnings for pulp production. The holes will quickly close, and subsequent thinnings will have to follow in a short period, and these thinnings

will become at each subsequent interval more profitable because the cost of cutting and peeling will be reduced as the size increases.

### Pruning and Maintenance of Crown Closure

Foresters have almost universally insisted on the maintenance of crown closure in growing stands of timber in order to hasten the death of the lower branches and consequently increase the quality of subsequent timber. While this method is effective, it is costly in terms of growth, and a better practice will probably be the pruning of the lower log in those trees which are to be reserved for the final crop so that excessive density need not be retained to provide clear timber. Pruning is necessary to remove the dead limbs in the dense stand method. This is where the pulpwood industry can be of material assistance in the production of saw timber. All except the final crop of knot-free logs can be used for pulp purposes, while some 200 trees pruned of the lower limbs on about 17 ft. of length when they were less than 5 in. in diam. will furnish high grade saw timber and the bulk of the profit to be obtained from the stand.

Red pine is found naturally throughout the northeast and west into the Lake States. Within the last few years a stand has also been discovered on the eastern border of West Virginia which further extended its range to the south. The species has proved to be especially suitable for planting on sites which would be too dry for any of the spruces. On the contrary, it will not occupy very wet lands and has shown some unfavorable results when planted on heavy clay soils. It is not as susceptible to frost damage as the Norway spruce or the white spruce, nor is it as resistant to frost damage as the Scotch pine or the jack pine. It has been considered relatively free from insect damage, although somewhat subject to sawfly injury and particularly to damage by the European pine-shoot moth. This insect threatened to be very serious among all our northern hard pines until an extremely cold winter severely reduced the population. On the whole, the species is much less subject to injury by insects and fungi than white pine or the Norway and white spruces. For the first 30 yr. of its life, it has shown ability to exceed in growth rate all of the coniferous species commonly used except larch, jack pine, and Scotch pine.

The supply of red pine is, of course, small up to this time but is increasing rapidly through planting. The Conservation Department of the State of New York reports that 138,000,000 red pine trees were distributed from its nurseries from 1909 to 1938 inclusive. A report covering the years 1929 to 1935 showed that red pine comprised about one third of

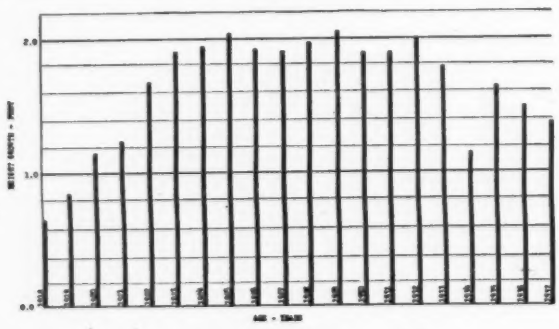

FIG. 3.

**Average height growth of 100 dominant red pine trees. Ranger School Forest, St. Lawrence County, N. Y.**

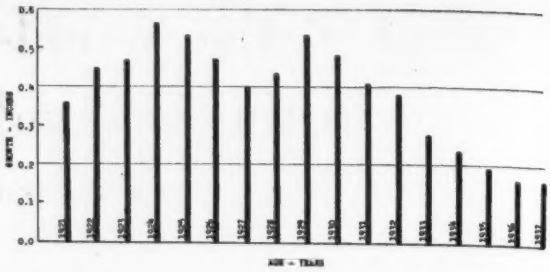

FIG. 4.

**Average annual diameter growth of 100 dominant red pine trees. Ranger School Forest, St. Lawrence County, N. Y.**

the 134,833,549 trees used in planting under the Hewitt Bill. While it was predicted that the increased damage by the European pine-shoot moth would curtail this planting, this probably will not be the case. The paper and pulp industry can assist materially by demonstrating the possibility of using red pine for pulp. Once the owners of red pine plantations and also prospective planters are convinced that there will be a market for the small materials from these plantations, they will go ahead with a great deal more confidence in the work of establishing them. Without doubt there is at the present time a sufficient quantity of planted softwood timber in the State to furnish two or more pulpwood mills with a continuous supply. The difficulty lies in the large variety of species used in the plantations and the scattered location of those plantations. Here again the pulpwood industry can, by furnishing centers of consumption, guide the selection of species in the establishment of future plantations. The whole program should be coordinated about the processing plant.

## Delaware TAPPI Discusses Consistency

The Delaware Valley Section of the Technical Association of the Pulp and Paper Industry met at the Engineers Club, Philadelphia, Pa., on Friday evening, November 10, 1939 at 6:30 P.M. C. M. Connor of the Valley Forge Laboratories presided as chairman.

The speaker was Frederick Wierk of Johnson & Wierk, consulting engineers, New York, N. Y., who discussed the design and principles of operation of the various consistency regulators on the market. This talk was followed by an interesting discussion in which specific problems were considered in detail. Mr. Wierks paper will be published at an early date.

Nearly 150 attended the meeting. Included among these were: Richard J. Auchter, Carl E. Anderson, Earl F. Anderton, J. R. Atwater, L. C. Boslin, W. E. Brow, Roy E. Bare, Richard T. Bingham, A. L. M. Bixler, William Budell, Samuel M. Bratton, R. M. Bates, J. M. Chestnutt, Robert de S. Couch, C. M. Connor, James A. Dean, R. H. Dillinger, Geo. H. Detwiler, J. D. Davis, Paul Easton, Joseph J. Fiori, R. M. Gavin, John T. Gercke, Harry Hulmes, H. F. Hoffmann, Ward Harrison, H. H. Hanson, L. Justine, R. W. K. Ulm, J. J. Lafferty, George B. Martin, F. J. McAndrews, M. Craig Maxwell, Alex McInnes, Jr., L. B. Miller, E. H. Monish, R. G. Macdonald, Robert Nelson, Geo. Oechsle, Carl V. Ploetz, A. N. Parrett, W. P. Quinn, E. H. Rheinhardt, John Roslund, Sam Reynolds, C. W. Rivise, E. I. Stokes, J. C. Shaw, J. Carl Schmidt, E. A. Shallcross, Howard H. Street, George M. Suydam, Henry C. Speel, G. L. Schwartz, John S. Thompson, Richard Tutt, Jr., F. Wierk, G. C. Walton, A. E. Waugh.

# Effect of the Wood-Stone Contact Area in the Groundwood Process*

By E. R. Schafer[1], and J. C. Pew[1]


## Abstract

*The effects of changing the area of the wood-stone contact have been studied in the Forest Products Laboratory experimental grinder. Both the width of the wood in the pockets and the number of pockets in operation were varied. Increasing the zone length (around the periphery of the stone) up to a certain extent gave improved results but too large a zone proved a detriment. Exact formulation of the relationships is difficult on account of the numerous factors involved. The increase in consistency and temperature along the contact zone appears to be of importance. These factors in turn depend upon many of the fixed conditions of the experiment, such as stone surface, consistency, and grinding rate. Aside from these factors the results suggest that the intimacy of contact between the wood and stone is affected by the magnitude of the contact area even when the unit pressure remains the same.*


The effects of the magnitude and distribution of the area of contact between wood and stone in mechanical pulping are of importance in commercial grinder design, in the interpretation of results from experimental grinders of greatly reduced scale, and in the understanding of the pulp grinding process itself. Comparatively little discussion on the subject is to be found in the literature. Parrett *(1)* observed that, in changing the width of the pocket of chain feed magazine grinders from 39½ in. to 53 in., a direct increase in production occurred but the extra power expended was out of proportion to the production increase and resulted in a greater energy consumption per cord of wood. This energy increase was not accompanied by quality improvement. He, also, found that if the grinding was conducted so as to maintain constant power input the widening of the pocket resulted in improved quality with about the same production rate. Brecht *(2)* reports the results of increasing the grinding zone from 6.7 inches to 18.1 in. in cold grinding studies with an experimental grinder. With the lengthening of the zone, the wood-feed rate dropped and the unit energy consumption increased. These factors were, however, offset by an improvement in the pulp quality. Edwards and co-workers *(3)* note that the pulp properties and the energy consumption appear to be about the same whether the contact zone is 1½ in., as in their miniature grinder; 7½ in., as in their semicommercial grinder; or 53 in., as in some commercial machines. They believe this to indicate that regrinding does not take place. Decided differences in friction coefficient in the three cases are, however, pointed out.

## Procedure

In an effort to arrive at a better understanding of grinding-zone relationships a series of experiments was conducted on the Forest Products Laboratory experimental grinder. This machine consists essentially of a 54-in. diameter by 8-in. face stone with three 16-in. width pockets for grinding wood bolts 6 in. long. A description of the grinder has been published *(4)*. Variation in contact zone was accomplished by grinding spruce wood in the form of rectangular blocks whose width was approximately one-third that of the pocket. In successive experiments the blocks were arranged in one, two, and three stacks, respectively, first in one pocket, then in two pockets, and finally in three pockets, making a total of nine experiments. All other conditions were maintained as nearly constant as possible from run to run. Since the experiments were of short duration and an artificial stone well beyond the initial stages of wear was used, change in the condition of the stone surface may be assumed to be negligible. The 36 wood blocks for each experiment were taken from the same logs and though numerous knots were present they were rather small; it is therefore unlikely that any major differences existed from one batch of wood to another. The pit temperature was held at 150 deg. F. by means of a grinder temperature controller and the consistency was controlled by manipulating the temperature of the shower water.

Since the amount of wood ground was small, a false pit consisting of a sheet metal trough was installed in the grinder in order to bring the consistency rapidly up to normal after starting the experiment. This trough, which allowed 3 in. of radial clearance and 2½ in. at each side of the stone, accomplished its purpose but unfortunately interfered somewhat with pulp circulation. The pressure was maintained at 40 lb. per sq. in. of wood-stone contact regardless of the area involved. The control of this value occasioned some difficulty since in those experiments where less than the full width of the pockets was occupied by the wood, eccentric loading of the pressure foot resulted, and increased the friction losses in the hydraulic cylinder. This made it necessary to calibrate the piston thrusts under eccentric loads.

The pulps were tested according to the tentative standard Forest Products Laboratory method no. 96, *(5)*. Grinding data and properties of the resulting pulps are given in Table I where they are grouped in three ways: (1) experiments with same contact area per pocket; (2) experiments using the same number of pockets; and (3) experiments having the same total area of contact.

### Effect of Number of Pockets

With a single stack of blocks to a pocket (Table I, series 1,a) it may be noted that increasing the number of pockets in operation results in a small increase in the production per unit area, an increase in the

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* Presented at the Fall Meeting of the Technical Association of the Pulp and Paper Industry, Hotel Syracuse, Syracuse, New York, September 12-14, 1939.

[1] Members TAPPI, Engineer and Associate Engineer, respectively, Forest Products Laboratory, Forest Service, U. S. Department of Agriculture, maintained at Madison, Wisconsin in cooperation with the University of Wisconsin.

friction coefficient, an increase in the pulp retained on the 24-mesh screen and a somewhat increased strength without much change in the unit energy consumption. With two stacks of blocks to a pocket (series 1,b), two-pocket operations, as compared with single-pocket, gives an increase in the unit-area production, an increase in the pulp retained on the 24-mesh screen, little change in the bursting strength, a slight increase in the tearing strength, and a decided reduction in the energy consumption. With the addition of another pocket (grinder run 315) these trends with the exception of the tearing strength are reversed. Practically the same thing takes place with three stacks of blocks to a pocket (series 1,c). Here, decidely poorer results are obtained with three-pocket operation, the tearing strength, as well, being adversely affected. The freeness of this run (grinder run 312) is the lowest of any of the experiments and the amount of pulp passing the 150-mesh screen is the highest.

### Effect of Number of Blocks Per Pocket

Comparing the data on the basis of increasing the number of blocks per width of pocket (series 2,a with one pocket and series 2,b with two pockets in simultaneous use), there is in each series a decrease in the production per unit area, an increase in unit energy consumption, an increase in 24-mesh screen fraction and an increase in the bursting and tearing strengths. The same trends are shown in series 2,c where the number of blocks per pocket width are increased with three pockets grinding simultaneously, except that when three blocks per width of pocket are used (grinder run 312) the fiber length, bursting strength, and tearing strength all decrease.

### Effect of Distribution of Contact Area

Next comparing the grinding of two stacks of blocks first in separate pockets and then together in one pocket as shown in Fig. 1 A and likewise one stack in each of three pockets with three stacks in one pocket as shown in Fig. 1 B, the concentration of the total contact area from two or more pockets into one, results (see Table I, series 3,a) in a lowered unit production rate, increased unit energy consumption, decreased friction coefficient, increased quantity of fiber on the 24-mesh screen and increased strength. However, when six stacks of blocks are divided into first three and then into two pockets as shown in Fig. 1 C it is noted in Table I series 3,c that the concentration of the total area causes very little change in the production, the energy consumption, or the pulp properties.

In general the results indicate that increasing the total area of contact both by charging more blocks per pocket width and by putting more pockets into operation improved pulp properties in most respects up to a maximum point approximately equal to two-thirds of the total available area. Why poorer results are obtained beyond this point is not readily apparent but certain theoretical considerations offer a plausible explanation.

### Effect of temperature and consistency

It is evident that, as the stone carries pulp through the contact zone, the temperature and consistency of the stock increases along the arc of contact. The authors have shown, *(6)* that increase in pit temperature results, almost invariably, in an increase in 24-mesh screen fraction, generally in slightly increased production rate and pulp strength, and often with a saving of energy. This temperature influence probably explains the effects noted in series 1,a and in the first two runs of series 1,b and 1,c. In the third runs of series 1,b and 1,c, however, another factor seems to have come into play which more than likely is, the increase in consistency occasioned by the greater contact zone. It is not only commonly believed but confirmed by experiment *(6)* that excessive consistency is detrimental to grinding.

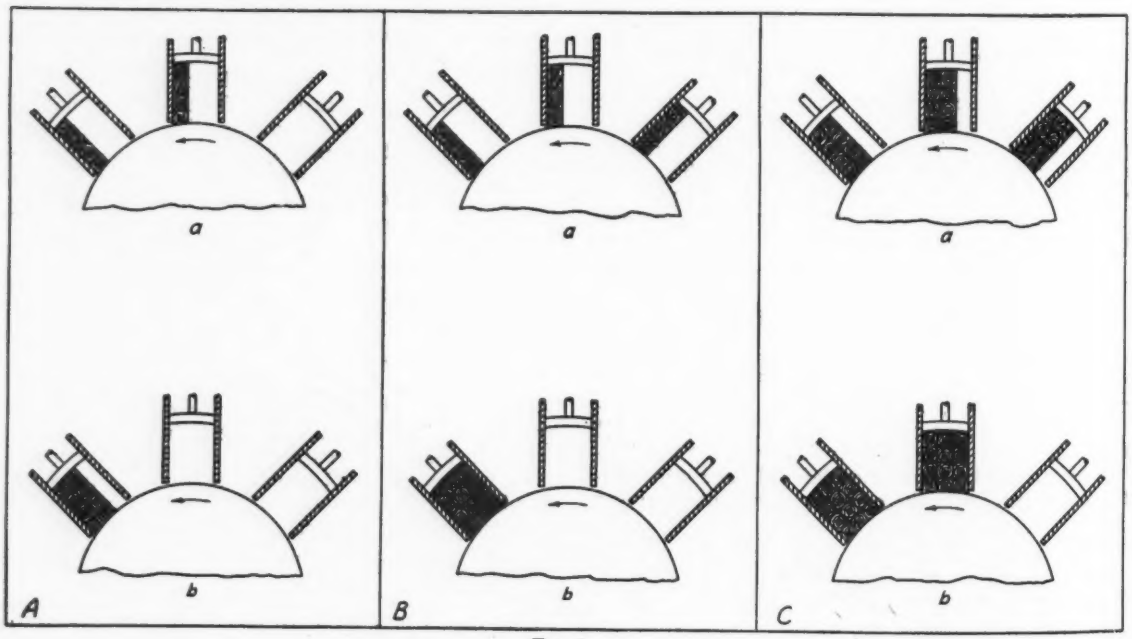


Fig. 1.
**Distribution of Blocks in Grinder Pockets**

A rough determination of the volume of the interstices in the surface of the stone used in these experiments gave a capacity of about 0.009 cu. in. per sq. in. of stone surface. Therefore, if operating at a pit consistency of 4 per cent and assuming the stone surface to be filled with pulp at the point of passage into the contact zone, a square inch of stone surface would contain $0.009 \times 0.00058 \times 62.4 \times 0.04 = 13 \times 10^{-6}$ lb. of fiber. If a production rate of 0.015 ton per sq. in. of surface per 24 hr. is assumed (see Table I), 1 sq. in. of stone surface would pick up in advancing 1 in. along the contact zone

$$\frac{0.015 \times 2000}{24 \times 60 \times 3150 \times 12} = 0.55 \times 10^{-6} \text{ lb. of fiber.}$$

A traverse of 24 in. would add $0.55 \times 10^{-6} \times 24 = 13.2 \times 10^{-6}$ lb. of fiber. The consistency of the emerging pulp would therefore be about double that of the entering film and the average consistency throughout the zone would be about 50 per cent greater than that of the entering film. Evidently under these conditions high consistency may exist with long grinding zones and may explain the reversal of the trends noted.

The temperature effects depend not only upon the length of grinding zone but, also, on the volume of the stone depressions per unit area, the pit temperature of the pulp, and the power input per unit area. The consistency effect depends upon the depression volume of the stone, the pit consistency, and the grinding rate. When several successive zones are considered, the matter becomes more complicated because possibilities exist for pulp to be thrown off and, also, for fresh pulp to be added to the stone as it passes from zone to zone.

### Results When Using Small Blocks of Wood

An additional experiment was made to demonstrate an extreme case where blocks only 1 square inch in cross section were ground, applying the proper unit pressure by means of a dead weight instead of the hydraulic cylinder. The pit temperature was maintained at 150 deg. F. and experiments made using both water only as a lubricant and with pulp in the pit from a previous grinder run at 4 per cent consistence as the lubricant. The grinding rate of these blocks averaged 0.049 ton per day per square inch regardless of the type of lubrication. This is considerably larger than the production rate of 0.018 ton per day per sq. in. for the single 4.9-in. by 6-in. block in the previous experiment (grinder run 320). Neither the temperature, consistency, nor the fact that the small blocks were clear wood, whereas the larger ones contained knots, is sufficient to explain this large difference. It seems probable that with the same unit pressure a thinner pulp film is maintained between a small area and the stone than with a large area, thus allowing a more intimate contact with the small area. Possibly exceedingly small differences in the relative position of wood and stone surface alter the average number of grits in contact and produce decided differences in grinding, but a full explanation is not apparent at present.

TABLE I.—THE EFFECT OF VARYING THE AREA OF THE WOOD-STONE CONTACT IN GRINDING

| | | Grinding conditions [1] | | | | | | | | | Properties of pulp suspension | | | | | | Properties of pulp test sheets | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Wood-stone contact | | Wood ground per 24 hours | | | | | Screen analysis | | Retained between— | | | | | | | |
| Series | Grinder run, no. | Pockets in use, simultaneous, no. | Blocks per pocket width, no. | Total arc, in. | Total area, sq. in. | Total, tons | Per sq. in. wood-stone contact, ton | Power input, hp. | Energy consumed per ton dry wood, hp. days | Speed of stone surface, ft. per min. | Grinding friction coefficient | Schopper-Riegler, cc. | Retained on 24 mesh, per cent | 24 and 42 mesh, per cent | 42 and 80 mesh, per cent | 80 and 150 mesh, per cent | Passing 150 mesh, per cent | Average screen opening, mm. | Bursting, Per lb. per ream, 25 x 40—500, point | Tearing, Per lb. per ream, 25 x 40—500, gram | Tensile per sq. in., pounds | Solid fraction |
| 1a | 320 | 1 | 1 | 4.92 | 29.52 | 0.53 | 0.0180 | 27.5 | 51.9 | 3,170 | 0.243 | 373 | 9.4 | 11.9 | 18.6 | 16.8 | 43.3 | 0.094 | 0.27 | 0.62 | 1,535 | 0.29 |
| | 319 | 2 | 1 | 9.83 | 58.98 | 1.12 | .0190 | 62.3 | 55.4 | 3,160 | .276 | 345 | 10.8 | 11.0 | 17.1 | 16.6 | 44.5 | .093 | .27 | .71 | 1,470 | .30 |
| | 318 | 3 | 1 | 14.75 | 88.50 | 1.81 | .0205 | 95.7 | 52.8 | 3,140 | .285 | 372 | 13.1 | 11.5 | 16.5 | 14.5 | 44.4 | .094 | .29 | .77 | 1,715 | .30 |
| 1b | 317 | 1 | 2 | 9.83 | 58.98 | .88 | .0136 | 55.4 | 62.9 | 3,160 | .246 | 355 | 15.9 | 11.0 | 16.3 | 14.3 | 42.5 | .098 | .31 | .77 | 1,765 | .30 |
| | 316 | 2 | 2 | 19.66 | 117.96 | 2.04 | .0173 | 114.0 | 56.1 | 3,140 | .255 | 335 | 21.6 | 7.2 | 14.9 | 15.0 | 41.3 | .100 | .30 | .81 | 1,610 | .28 |
| | 315 | 3 | 2 | 29.50 | 177.00 | 2.71 | .0153 | 170.0 | 62.6 | 3,120 | .254 | 313 | 20.1 | 8.3 | 14.2 | 14.5 | 42.9 | .098 | .32 | .91 | 1,705 | .30 |
| 1c | 314 | 1 | 3 | 14.75 | 88.50 | 1.24 | .0140 | 81.3 | 65.8 | 3,150 | .241 | 333 | 17.6 | 8.9 | 14.1 | 15.5 | 43.9 | .095 | .32 | .81 | 2,000 | .30 |
| | 313 | 2 | 3 | 29.50 | 177.00 | 2.54 | .0144 | 158.0 | 61.9 | 3,130 | .235 | 347 | 20.0 | 9.3 | 14.9 | 15.0 | 40.8 | .101 | .32 | .93 | 1,540 | .29 |
| | 312 | 3 | 3 | 44.25 | 265.50 | 3.06 | .0115 | 224.0 | 73.2 | 3,110 | .224 | 263 | 14.7 | 7.8 | 13.0 | 15.4 | 49.1 | .088 | .31 | .77 | 1,730 | .30 |
| 2a | 320 | 1 | 1 | 4.92 | 29.52 | .53 | .0180 | 27.5 | 51.9 | 3,170 | .243 | 373 | 9.4 | 11.9 | 18.6 | 16.8 | 43.3 | .094 | .27 | .62 | 1,535 | .29 |
| | 317 | 1 | 2 | 9.83 | 58.98 | .88 | .0136 | 55.4 | 62.9 | 3,160 | .246 | 355 | 15.9 | 11.0 | 16.3 | 14.3 | 42.5 | .098 | .31 | .77 | 1,765 | .30 |
| | 314 | 1 | 3 | 14.75 | 88.50 | 1.24 | .0140 | 81.3 | 65.8 | 3,150 | .241 | 333 | 17.6 | 8.9 | 14.1 | 15.5 | 43.9 | .095 | .32 | .81 | 2,000 | .30 |
| 2b | 319 | 2 | 1 | 9.83 | 58.98 | 1.12 | .0190 | 62.3 | 55.4 | 3,160 | .276 | 345 | 10.8 | 11.0 | 17.1 | 16.6 | 44.5 | .093 | .27 | .71 | 1,470 | .30 |
| | 316 | 2 | 2 | 19.66 | 117.96 | 2.04 | .0173 | 114.0 | 56.1 | 3,140 | .255 | 335 | 21.6 | 7.2 | 14.9 | 15.0 | 41.3 | .100 | .30 | .81 | 1,610 | .28 |
| | 313 | 2 | 3 | 29.50 | 177.00 | 2.54 | .0144 | 158.0 | 61.9 | 3,130 | .235 | 347 | 20.0 | 9.3 | 14.9 | 15.0 | 40.8 | .101 | .32 | .93 | 1,540 | .29 |
| 2c | 318 | 3 | 1 | 14.75 | 88.50 | 1.81 | .0205 | 95.7 | 52.8 | 3,140 | .285 | 372 | 13.1 | 11.5 | 16.5 | 14.5 | 44.4 | .094 | .29 | .77 | 1,715 | .30 |
| | 315 | 3 | 2 | 29.50 | 177.00 | 2.71 | .0153 | 170.0 | 62.6 | 3,120 | .254 | 313 | 20.1 | 8.3 | 14.2 | 14.5 | 42.9 | .098 | .32 | .91 | 1,705 | .30 |
| | 312 | 3 | 3 | 44.25 | 265.50 | 3.06 | .0115 | 224.0 | 73.2 | 3,110 | .224 | 263 | 14.7 | 7.8 | 13.0 | 15.4 | 49.1 | .088 | .31 | .77 | 1,730 | .30 |
| 3a | 319 | 2 | 1 | 9.83 | 58.98 | 1.12 | .0190 | 62.3 | 55.4 | 3,160 | .276 | 345 | 10.8 | 11.0 | 17.1 | 16.6 | 44.5 | .093 | .27 | .71 | 1,470 | .30 |
| | 317 | 1 | 2 | 9.83 | 58.98 | .88 | .0136 | 55.4 | 62.9 | 3,160 | .246 | 355 | 15.9 | 11.0 | 16.3 | 14.3 | 42.5 | .098 | .31 | .77 | 1,795 | .30 |
| 3b | 318 | 3 | 1 | 14.75 | 88.50 | 1.81 | .0205 | 95.7 | 52.8 | 3,140 | .285 | 372 | 13.1 | 11.5 | 16.5 | 14.5 | 44.4 | .094 | .29 | .77 | 1,715 | .30 |
| | 314 | 1 | 3 | 14.75 | 88.50 | 1.24 | .0140 | 81.3 | 65.8 | 3,150 | .241 | 333 | 17.6 | 8.9 | 14.1 | 15.5 | 43.9 | .095 | .32 | .81 | 2,000 | .30 |
| 3c | 315 | 3 | 2 | 29.50 | 177.00 | 2.71 | .0153 | 170.0 | 62.6 | 3,120 | .254 | 313 | 20.1 | 8.3 | 14.2 | 14.5 | 42.9 | .098 | .32 | .91 | 1,705 | .30 |
| | 313 | 2 | 3 | 29.50 | 177.00 | 2.54 | .0144 | 158.0 | 61.9 | 3,130 | .235 | 347 | 20.0 | 9.3 | 14.9 | 15.0 | 40.8 | .101 | .32 | .93 | 1,540 | .29 |

[1] Constant conditions were:
Stone—Norton 3760/5-N7 composed of silicon carbide abrasive. Surface dressed with a 10-cut, 1½-in. lead spiral burr. Stone used 70 hr. (3 pocket, 3,150 f.p.m. equivalent) before starting experiments.
Pressure of wood against stone—40 lb. per sq. in.
Grinder pit temperature—150 deg. F.
Grinder pit consistency—3.5 to 4.4 per cent.
Stone immersion—7 in.
Shower water—zeolite softened, varying in temperature from 80 to 115 deg. F. from run to run.
Wood—white spruce, shipment 1502, density 22.4 lb. per cu. ft. and dryness 67.8 per cent.

From the standpoint of commercial grinder design it might appear that the total arc of wood-stone contact desirable for highest efficiency is limited by the other operating conditions. The study, also, suggests that in working with small areas, as in miniature grinders, unit pressure is not of fundamental importance but rather that the pressure should be adjusted so as to maintain normal wood advance with relation to stone surface speed.

### Literature Cited

(1) *Pulp Paper Mag. Canada*, 33, no. 3: 135 (May, 1932).
(2) *Papier-Fabr.*, 33, no. 14: 121 (April 7, 1935).
(3) *Pulp Paper Mag. Canada*, 38, no. 2: 121-132 (February, 1937).
(4) *Paper Trade J.*, 100, no. 25: 19 (June 20, 1935).
(5) Forest Products Laboratory. Manual for pulpwood, pulp, stuff and paper.
(6) *Paper Trade J.*, 101, no. 13: 71-76 (Sept. 26, 1935).

# Review Of Paper Industry Literature

**Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.**

## Machinery

**Doctor Mechanism for Rolls and Cylinders.** Frederick W. Lodding. U. S. pat. 2,117,032 (May 10, 1938).—The invention provides various improvements in construction of the doctor described in Lodding's U. S. pat. 1,982,214, of Dec. 27, 1932, characterized by mounting the blade in such a manner that its scraping edge adjusts itself to the surface being doctored, with provision for compensating for wear of the blade so that the pressure is always applied at the proper place. (Cl. 92-74).—A.P.-C.

**Web Guiding Device.** Wm. C. Nash assignor of one-fifth each to Mary Jones, Marie Duvall Nash, Wm. M. Nash and Roy A. Nash. U. S. pat. 2,108,232 (Feb. 15, 1938).—The invention provides automatic, electrically controlled and operated means for longitudinally shifting the shaft from which a roll of paper is being unwound, so as to maintain the edges of the paper in a constant straight line. (Cl. 242-76).—A.P.-C.

**Paper Machine.** Albert Richards. U. S. pat. 2,131,754 (Oct. 4, 1938).—The invention provides an auxiliary rope-grooveway for each of the driers so that in the event the ropes become displaced, they will be caught by the auxiliary grooveways. This is effected by an attachment consisting of a curved plate secured to the rope-groove end of the drying cylinder, and having at its outer edge an outwardly extending flange spaced from the end of the drier. (Cl. 34-48).—A.P.-C.

**Embossing, Perforating and Rewinding Machine.** Peter J. Christman. U. S. pat. 2,127,246 (Aug. 16, 1938).—Improvements are provided in embossing, perforating and rewinding machines used in making rolls of toilet paper, paper towels, etc. Independent embossing and perforating means are incorporated in a unitary structure, so that either both operations or perforation alone can be carried out at will, and the perforating knives may be easily changed to compensate for different grades of papers. The web of paper is run over a bed roll, and an embossing roll and perforating head independently co-act with the bed roll to perform their respective functions. (Cl. 101-23).—A.P.-C.

**Art and Machine for Working Paper.** Douglas M. McBean, assignor to The Paper Service Company. U. S. pat. 2,124,582 (July 26, 1938).—The patent provides various mechanical features in the design and construction of a machine for crinkling paper stock in one direction, forming a multiplicity of longitudinal laterally yielding folds at right angles to the crinkles and preparing the same ready for use for linings of sugar bags and the like. (Cl. 154-30).—A.P.-C.

**Save-All.** Ivar Wallquist. U. S. pat. 2,129,802 (Sept. 13, 1938).—A common wire passes around two (or more) cylinder molds each mounted in a separate vat. The white water is fed into the first vat, where the coarser material is held on the wire, while the finer passes inside the cylinder mold with the water and is delivered to the second vat, where the fine solid material is held on the mat formed on the wire in the first vat. If a third cylinder mold is used, the water is delivered to its vat, and so on. The fiber layer is scraped or washed off the wire after it has left the last cylinder mold. (Cl. 210-198).—A.P.-C.

**Decortication of Fibrous Plants.** A. T. Ratliff and R. R. Guice. Brit. pat. 476,569 (June 5, 1936).—Light and bulky fibrous plants (such as maize stalks, pine needles, etc.) are digested under pressure with water in a direct steam-heated digester. They are then explosively disintegrated by rapidly discharging into a second and larger digester in which fiber-liberation is completed by cooking with water or any suitable reagents. Direct steam heating is also used in the second digester.—A.P.-C.

**Device for the Continuous Removal of Impurities from Paper Pulp.** André Charles Bergès. Fr. pat. 824,653.—The invention provides various mechanical features in the design and construction of centrifugal pulp purifiers such as to obtain a practically perfect continuous separation of the good stock from both light and heavy impurities.—A.P.-C.

**Suction Roll.** J. M. Voith. Fr. pat. 827,986.—In a suction roll in which the roll and the inside suction compartments rotate while the suction head (or heads) remain stationary a suitable "deckle" is provided inside and mounted on one or both heads. By suitable displacement parallel to the axis of the roll the length of the active suction area of the roll can be adjusted according to the width of the sheet of paper.—A.P.-C.

**Outlet for the Delivery of Stock on the Paper Machine.** J. M. Voith Company. Fr. pat. 830,962.—The outlet is adjustable as regards its position over the breast roll, the angle of delivery of the stock on to the wire and the width of the orifice, all adjustments being independent of the head box.—A.P.-C.

**Vacuum System for Suction-Box Apparatus of a Suction Roll.** Irving C. Jennings. Brit. pat. 485,597 (May 23, 1938).—The system comprises a number of suction chambers nested or arranged within one another, a number of pumping means effective to produce and maintain a vacuum in each of the chambers and means operative to interconnect the pumping means whereby in addition to its normal operation one of the pumping means supplements the action of another.—A.P.-C.

# Imports of Paper and Paper Stock

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WEEK ENDING NOVEMBER 11, 1939

SUMMARY

Cigarette paper .....359 cs.
Wall paper .....11 cs.
Newsprint .....4,491 rolls
Wrapping paper ..... 9 cs.
Packing paper .....100 bls.
Filter paper .....82 cs.
Filter pulp.....50 bls.
Decalcomanias .....8 cs.
Decalcomania paper .....1 cs.
Surface coated paper.....219 cs.
Photo paper.....1 cs.
Writing paper.....2 cs.
Stencil paper.....3 cs.

CIGARETTE PAPER

Champagne Paper Corp., *Indep. Hall,* Bordeaux, 271 cs.
De Manduit Paper Corp., *Indep. Hall,* St. Nazaire, 88 cs.

WALL PAPER

Pitt & Scott, *Indep. Hall,* Havre, 11 cs.

NEWSPRINT

Jay Madden Corp., *Telamon,* Curacao, 286 rolls.
Jay Madden Corp., *Marisa Thorden,* Kotka, 1,099 rolls.
International Paper Co., *International #1,* Gatineau, 358 rolls.
H. G. Craig Co., Inc., *Newscarrier,* Donnacona, 370 rolls.
H. G. Craig Co., Inc., *A.C.D.,* Donnacona, 328 rolls.
H. G. Craig Co., Inc., *Kermic,* Donnacona, 326 rolls.
International Paper Co., *G.T.D.,* Gatineau, 328 rolls.
Jay Madden Corp., *Carolina Thorden,* Kotka, 900 rolls.
H. Reeve Angel & Co., Inc., *Carolina Thorden,* Kotka, 496 rolls.

WRAPPING PAPER

F. C. Strype, *Veendam,* Rotterdam, 9 cs.

PACKING PAPER

J. P. Heffernan Paper Co., *Excambion,* Genoa, 100 bls.

FILTER PAPER

J. Manheimer, *Indep. Hall,* Bordeaux, 76 cs.
C. Schleicher & Schull Co., Inc., *Vulcania,* Genoa, 6 cs.

FILTER PULP

H. Reifenberg, *Veendam,* Rotterdam, 50 bls.

DECALCOMANIAS

General Motors Overseas Operations, *Zaandam,* Rotterdam, 8 cs.

DECALCOMANIA PAPER

Industrial Decalcomania Co., *Vulcania,* Trieste, 1 cs.

SURFACE COATED PAPER

Gevaert Co. of America, *Westernland,* Antwerp, 109 cs.
Gevaert Co. of America, *Veendam,* Rotterdam, 110 cs.

PHOTO PAPER

Gevaert Co. of America, *Westernland,* Antwerp, 1 cs.

WRITING PAPER

L. Bamberger Co., *Indep. Hall,* Havre, 1 cs.
Gimbel Bros., *Indep. Hall,* Havre, 1 cs.

STENCIL PAPER

American Indicator Co., *Komaki Maru,* Kobe, 3 cs.

RAGS, BAGGINGS, ETC.

E. J. Keller Co., Inc., *Zaandam,* ——, 188 bls. rags.
——, *Veendam,* Rotterdam, 147 bls. rags.
D. M. Hicks, Inc., *Black Heron,* Antwerp, 95 bls. flax waste.
J. W. Green, *Black Heron,* Antwerp, 50 bls. flax waste, 5 bls. rags.
American Express Co., *Black Heron,* Antwerp, 62 bls. rags.
——, *Cristobal,* Cristobal, 8 bls. rags.
National City Bank, *Veendam,* Rotterdam, 153 bls. rayon waste.

OLD ROPE

——, *Black Heron,* Antwerp, 86 bls.
——, *Cristobal,* Cristobal, 33 bls.

PICKERS

Atlas Raw Hide Co., *Zaandam,* Rotterdam, 10 bls. dry pickers.

CASEIN

A. Hurst & Co., *Indep. Hall,* Bordeaux, 2,000 bags.
American British Chemical Supplies, ——, Bordeaux, 334 bags.

### NEWARK IMPORTS

WEEK ENDING NOVEMBER 11, 1939

Pulp Sales Corp., *Marisa Thorden,* Viipuri, 550 bls. bleached sulphate, 4907 bls. wet sulphite.
H. G. Craig Co., Inc., *Donpaco,* Donnacona, 250 rolls newsprint.

### BOSTON IMPORTS

WEEK ENDING NOVEMBER 11, 1939

Parsons & Whittemore, Inc., *Tana,* ——, 250 bls. wood pulp.

### PHILADELPHIA IMPORTS

WEEK ENDING NOVEMBER 11, 1939

American Cyanamid & Chemical Co., *Mormacsea,* Buenos Ayres, 300 bags casein.

### BALTIMORE IMPORTS

WEEK ENDING NOVEMBER 11, 1939

Price & Pierce, Ltd., *Etna,* ——, 4860 bls. unbleached sulphate, 816 bls. unbleached sulphate.
Price & Pierce, Ltd., *Hera,* ——, 1,250 bls. unbleached mechanical pulp. 1,500 bls. unbleached sulphite, 8,880 bls. unbleached sulphate.
Jay Madden Corp., *Carolina Thorden,* Kotka, 1,928 rolls newsprint.
H. Reeve Angel & Co., Inc., *Carolina Thorden,* Kotka, 1,150 rolls newsprint.
Pulp Sales Corp., *Carolina Thorden,* Kotka, 3,600 bls bleached sulphate, 1,683 bls. bleached sulphite.

### NORFOLK IMPORTS

WEEK ENDING NOVEMBER 11, 1939

H. H. Strauss, *Indep. Hall,* Bordeaux, 77 cs. cigarette paper.
American Tobacco Co., *Indep. Hall,* Bordeaux, 108 cs. cigarette paper.
R. J. Reynolds Tobacco Co., *Indep. Hall,* St. Nazaire, 2,264 cs. cigarette paper.
Champagne Paper Corp., *Indep. Hall,* St. Nazaire, 102 cs. cigarette paper.

### NEWPORT NEWS IMPORTS

WEEK ENDING NOVEMBER 11, 1939

De Manduit Paper Corp., *Indep. Hall,* St. Nazaire, 100 cs. cigarette paper.

### LOS ANGELES IMPORTS

WEEK ENDING NOVEMBER 11, 1939

——, *Colombia,* Norrkoping, 172 rolls newsprint.
——, *Bonnington Court,* Shanghai, 184 tons rags.
——, *Rosebank,* Powell River, 878 pkgs. newsprint.

## N. C. Pulp Co. Buys Seedlings

The North Carolina Pulp Company at Plymouth, Washington County, N. C. has placed an order for 116,500 forest tree seedlings with the forestry division of the Department of Conservation and Development and will start taking delivery on these trees about December 1. Assistant State Forester F. H. Claridge, in charge of forest managements, said. These seedlings will be supplied by the State Forest Nursery near Clayton, which is expected to yield approximately 5,000,000 seedlings this year.

Recently Forester Claridge spent several days with S. A. Boutwell, forester for the North Carolina Pulp Company, inspecting different areas upon which the company is planning to plant forest seedlings. Several areas were selected in Martin, Gates, Bertie and Hertford counties. Planting operations will start about December 1, Mr. Claridge said. The seedlings will consist mainly of loblolly pine, with some shortleaf, slash and longleaf pines.

This company made an effort to get seedlings from the State Forest Division last year, but placed its order so late that the supply of trees had been exhausted, Mr. Claridge said. The order placed for this year is much larger and plans call for the reforesting of a much larger area.

"The planting of these trees by the North Carolina Pulp Company should prove an incentive for other landowners to reforest their denuded lands," Mr. Claridge said. "If it pays a big corporation like this to plant forest seedlings, it will pay farmers and other land owners to reforest smaller areas."

## F. P. Vaughan Leaves Bay West Paper

At the last meeting of the board of directors of the Bay West Paper Company, Green Bay, Wis., Frank P. Vaughan tendered his resignation as treasurer and general manager to devote his entire time as president of Tested Papers of America, Inc.

The following appointments have been made by the Bay West Paper Company that policies established by the Company for the manufacture and merchandising of the products could be continued under well-trained and responsible direction: William J. Servotte, treasurer and general manager; Robert M. Quigley, sales manager.

## John T. Gamble Goes To California

SAVANNAH, Ga., November 6, 1939—John T. Gamble, plant manager, Union Bag and Paper Corporation here, whose resignation was announced last week by M. E. Cody, resident manager for the corporation, will go to California. Other than that he intends to "do a little traveling," Mr. Gamble said he had no plans to announce at the present. Mr. Cody said he had not selected Mr. Gamble's successor.

## Blandy Paper Co. Start Pulp Mill

The pulp mill of the Blandy Paper Company at Center Falls started operations last week and preparations are being made for starting of other grinders and presses. With those units in operation, about 17 men will be given employment.

## Japan's Paper Industry Prospers

WASHINGTON, D. C., November 1, 1939—Notwithstanding restrictions on "non-emergency" activities, Japan's paper-manufacturing industry at the end of the first half of this year was in a notably strong position, according to a report to the Department of Commerce from Assistant American Commercial Attache D. W. Smith, Tokyo.

Exports of paper from Japan in the three months ended June 30, 1939, were the second highest quarterly exports on record. Total shipments amounted to approximately 99,000,000 pounds, an increase of 27 per cent over the volume exported in the first quarter.

The heavy volume of paper shipments from Japan during the second quarter of 1939 was due chiefly to increased exports to yen-bloc countries which accounted for 90 per cent of this trade. Shipments to Manchukuo, Kwantung Leased Territory, and China totaled 89,604,000 pounds in the April-June period of this year, compared with 70,861,000 pounds during the first quarter, while exports to foreign currency countries increased from 7,634,900 pounds to 9,643,200 pounds. Heavy volume gains were recorded in paper shipments to the Netherlands Indies, Siam, Germany and Australia during the second quarter.

## Penn. Salt To Move Plant

PHILADELPHIA, Pa., November 13, 1939—After nearly three-quarters of a century on its present site in Philadelphia, the Pennsylvania Salt Manufacturing Company announces that it is moving its Philadelphia plant to a new location in the Philadelphia area more suitable for an expansion program planned for some time, according to statement by Mr. Leonard T. Beale, president of that company.

"Our Research Laboratory and Pilot Plant operations, which for some years have been badly cramped in the present location, will also be moved to the new site where ample space will be provided for expansion in this important phase of the Company's work. Our executive, accounting, and sales offices will remain as at present at 1000 Widener Building, Philadelphia."

Pennsylvania Salt is one of Philadelphia's oldest and most progressive industries. It has been identified with that city for more than three-quarters of a century. The headquarters of the company have been established in Philadelphia since 1850, and the company entertains no thought of moving its mid-city offices.

## Raymond Kelly Leaves Bathurst

Raymond Kelly has resigned as vice-president in charge of sales of the Bathurst Power and Paper Company Limited. Mr. Kelly, whose resignation becomes effective on December 31 this year will establish his own organization in New York at the first of the new year for the sale of paper and paper products. He will, among other lines, represent Bathurst in the sale of newsprint in the United States.

Prior to coming to Canada in 1926 as vice-president of St. Maurice Valley Sales Limited Mr. Kelly was general sales manager of Kimberly-Clark Company and vice-president of Cellucotton Products Company. Mr. Kelly became vice-president of the Bathurst Power and Paper Company Limited in 1937.

# LATEST MARKET REVIEW

## New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, November 15, 1939.

Reports from many leading manufacturers' representative, jobbers, and general paper merchants during the current week indicate that activity in the wholesale paper market continues at a high level, although a little less activity is noted in the sales volume of some grades of paper. The consensus of opinion among merchants apparently reflects the opinion that the market situation is now more stable and that, while events abroad should contribute to a higher level of domestic business, a moderate rise in consumer demand may be expected from improved domestic business volume.

The index of general business activity as reflected in the production and current volume of the components comprising the index, including production of paper, rose to 105.5 per cent for the week ended November 4, from 104.6 per cent for the preceding week, compared with 89.6 per cent for the corresponding week last year. In 1937, the index rose to 110 and in 1929 reached 115.

Paper production as indicated in reports of 201 paper mills for the week ended November 4, was estimated at 98.4 per cent, compared with 82.4 per cent for the corresponding week in 1938, and with 60.9 per cent for the like period in 1937. Paper board production for the week ended November 4 was 84.0 per cent, compared with 68.0 per cent for the like period in 1938, and with 56.0 per cent in 1937.

No important change in the newsprint situation has been reported at this date. October production of domestic mills for October totaled 78,591 tons, with mill stocks reported at 15,923 tons at the end of October. Canadian production for October totaled 280,985 tons; stocks on hand at the end of October, 192,609 tons.

### Mechanical Pulp

Demand continues to be reported heavy for all grades of mechanical pulp. Prices are firm, with no change in market quotations reported for the current week.

### Chemical Pulp

Prices on all grades of domestic and imported pulp continue firm and unchanged at prevailing market quotations. In the opinion expressed in some quarters of the pulp trade, shipment from Sweden and Norway are expected to continue in substantial volume, despite some unavoidable delay occasioned by the intensity of hostilities. It is also expected that the higher costs of manufacture abroad, due in great part to the higher costs of coal, will result in higher prices later on.

### Old Rope and Bagging

Prices on old rope continue to be reported as steady, with no important change in the market situation at this date. Trading in old bagging is more active this week, with the trade expecting a rise in prices when the looked for increase in demand occurs. At this date mill demand is under trade expectations. Prices remain unchanged at prevailing market levels.

### Rags

Trading in the domestic rag market which has been less active since the spurt in buying for export a few weeks ago, is currently reported as rather quiet. Mill buying continues in fair volume. Prices remain firm and no important change in quotations has been reported this week.

### Old Waste Paper

The paper stock market is reported as a little soft this week but prices hold and no important change in quotations on any grade of old waste paper has been reported at this date.

### Twine

No important change in the market situation of hard of soft fiber twines has been reported this week. The trade is expecting some price advances on soft fiber twines in the near future, due to increase in the cost of raw fibers.

## Saxon Paper Products To Move

In one of the largest leases of its kind closed during the year, the Saxon Paper Products Inc., for many years at 15-17 Mercer Street, has leased from Gimbel Brothers for a long term of years, the store, basement, second and third floors containing 75,000 square feet in the building at 249-255 West 17th street, running through to 236-242 West 18th Street.

The lease, which will bring an important addition to the growing number of leading paper manufacturing firms concentrating in the South Chelsea Section, was arranged by Adams & Co. Real Estate Inc. representing the tenant, and Cross & Brown Co. representing the landlord. Possession of the new space will be taken about January 1, 1940 after extensive alterations have been made to meet requirements of the tenant.

Attorneys in the transaction were Chadbourne, Wallace, Parke & Whiteside, acting for Gimbel Brothers, and Nathan Kosseff, acting for the Saxon Paper Products Inc.

## H. C. Phillips Paper Co. Starts

INDIANAPOLIS, Ind., November 11, 1939—The H. C. Phillips Paper Company has been established at 252 East Wabash street here and will do a wholesale paper business.

# Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, November 15, 1939.

BLANC FIXE—Quotations on blanc fixe are firm under a good demand, with prices conforming to prevailing market levels. The pulp is currently quoted at from $42.50 to $45 per ton, in bulk; the powder is offered at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER—Prices on bleaching powder are firm under an active demand, with prices unchanged at prevailing market quotations. Bleaching powder is currently quoted at from $2 to $2.85 per 100 pounds, in drums, at works.

CASEIN—Quotations on casein are firm under a good demand. Standard domestic casein, 20-30 mesh, is currently quoted at 20 cents per pound; 80-100 mesh, at 20½ cents per pound. All prices in bags, car lots. Argentine casein, 20-30 mesh, is quoted at 15 cents per pound. Quotations on French casein are nominal.

CAUSTIC SODA—Quotations on caustic soda are firm under an active demand. Solid caustic soda is currently quoted at from $2.30 to $2.40 per 100 pounds; flake and ground at from $2.70 to $2.95 per 100 pounds, in drums, at works.

CHINA CLAY—Prices on china clay continue firm under a good demand. Domestic filler clay is quoted at from $7 to $15 per ton; coating clay at from $11 to $22 per ton, at mines. Imported clay is quoted at from $13 to $25 per ton, ship side.

CHLORINE—Quotations on chlorine continue firm under an active demand at prevailing market levels. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The rosin market is reported firm for the current week. Prices continue unchanged. "G" gum rosin is quoted at $5.50 per 280 pounds, gross weight, in barrels, at Savannah. "FF" wood rosin is currently quoted at $5.20 per 280 pounds, gross weight, in barrels, New York. Seventy per cent gum rosin size is quoted at $2.90 per 100 pounds, f.o.b., shipping point.

SALT CAKE—Quotations on salt cake are firm under a heavy demand, with prices unchanged at prevailing market levels. Current quotations range at from $15 to $19 per ton; chrome salt cake at from $15 to $16 per ton, f.o.b., shipping point. Quotations on imported salt cake are nominal.

SODA ASH—Prices on soda ash are firm under a good demand, with quotations unchanged at prevailing market levels. Quotations on soda ash in car lots, at works, per 100 pounds, are as follows: in bulk, $.90; in bags, $1.10; and in barrels, $1.35.

STARCH—Quotations on corn starch are firm and unchanged at prevailing market prices. Globe pearl is currently quoted at $2.45; special paper starch at $2.55 per 100 pounds; all prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Prices on sulphate of alumina are firm under a good demand. The commercial grades are currently quoted at $1.15; iron free at $1.45 per 100 pounds, in bags, car lots, f.o.b., works.

SULPHUR—Quotations on sulphur are firm under a good demand and unchanged at prevailing market levels. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are offered at $19 per ton.

TALC—Prices on talc are firm under a good demand and conform to prevailing market quotations. Domestic talc is currently quoted at from $15 to $18 per ton, Eastern mines. Quotations on imported talc are nominal.

# Market Quotations

## Paper

(Delivered New York)

| | | | |
|---|---|---|---|
| News, per ton— | | | |
| Roll, contract | $50.00 | @ | — |
| Sheets | 58.00 | " | — |
| Kraft—per cwt.—Delivered Zone A | | | |
| Northern, Extra Quality | $4.87½ | @ | $5.50 |
| Superstandard | 4.50 | " | 5.00 |
| Northern Standard Wrapping | 4.25 | " | 4.50 |
| Standard Wrapping | 4.00 | " | — |
| Tissues—Per Ream—Carlots | | | |
| White No. 1 | .87½ | @ | — |
| White No. 1 M. G. | .85 | " | — |
| White No. 1½ | .70 | " | — |
| White No. 2 | .65 | " | — |
| Anti-Tarnish M. G. | .75 | " | — |
| Colored | .80 | " | — |
| Kraft | .75 | " | — |
| Manila | .65 | " | — |
| Unbl. Toilet, 1 M. | 3.35 | " | — |
| Bleached Toilet | 5.26 | " | — |
| Paper Towels, Per Case— | | | |
| Unbleached, Jr. | 1.85 | @ | — |
| Bleached, Jr. | 3.20 | " | — |
| Manila—per cwt.—C. l. f. a. | | | |
| No. 1 Jute | 8.25 | @ | 10.25 |
| No. 1 Manila Wrapping, 35 lb. | 5.25 | " | — |
| No. 2 Manila Wrapping, 35 lb. | 5.00 | " | — |
| Boards, per ton— | | | |
| News | 45.00 | @ | — |
| Chip | 45.00 | " | — |
| Sgl. Mla. Ll. Chip | 57.50 | " | — |
| Jute Lined Chip | 57.50 | " | — |
| White Pat. Coated | 70.00 | " | — |
| Kraft Liners | $5.00 | " | — |
| Binders Boards | 76.00 | " | 87.00 |

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

| | Bonds | | Ledgers | |
|---|---|---|---|---|
| 100% Rag Ext. No. 1 | $39.10 | @ $46.00 | $40.25 | @ $47.25 |
| 100% Rag | 31.05 | " 36.50 | 32.20 | " 37.75 |
| 85% Rag | .... | " .... | 29.90 | " 35.00 |
| 75% Rag | 23.60 | " 27.75 | 24.75 | " 29.00 |
| 65% Rag | .... | " .... | 21.65 | " 26.25 |
| 50% Rag | 17.55 | " 21.50 | 18.70 | " 22.75 |
| 25% Rag | 14.65 | " 17.75 | 15.80 | " 19.25 |

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

| | Bonds | | Ledgers | |
|---|---|---|---|---|
| No. 1 | $8.95 | @ $11.00 | $10.10 | @ $12.25 |
| No. 2 | 8.05 | " 9.75 | 9.25 | " 11.25 |
| No. 3 | 7.60 | " 9.25 | 8.50 | " 10.75 |
| No. 4 | 7.30 | " 9.00 | 8.50 | " 10.25 |

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper, Delivered in Zone 1:

| | | | |
|---|---|---|---|
| No. 1 Glossy Coated | $11.90 | @ | $13.50 |
| No. 2 Glossy Coated | 10.35 | " | 11.75 |
| No. 3 Glossy Coated | 9.55 | " | 11.00 |
| No. 4 Glossy Coated | 9.15 | " | 10.50 |
| No. 1 Antique (watermarked) | 8.35 | " | 9.50 |
| No. 2 Offset | 7.70 | " | 9.00 |
| A Grade E. F. | 7.50 | " | 8.75 |
| A Grade S. & S. C. | 7.75 | " | 9.00 |
| B Grade E. F. | 6.95 | " | 8.00 |
| B Grade S. & S. C. | 7.20 | " | 8.25 |
| C Grade E. F. | 6.65 | " | 7.75 |
| C Grade S. & S. C. | 6.90 | " | 8.00 |
| D Grade E. F. | 6.40 | " | 7.50 |
| D Grade S. & S. C. | 6.65 | " | 7.75 |

Ivory & India at $.50 cwt. extra.

## Mechanical Pulp

(On Dock, Atlantic Ports)

| | | | |
|---|---|---|---|
| No. 1 Imported— | | | |
| Moist | 30.00 | @ | 35.00 |
| Dry | 30.00 | " | 35.00 |
| (Delivered) | | | |
| No. 1 Domestic and Canadian | 38.00 | @ | 40.00 |

## Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

| | | | |
|---|---|---|---|
| Bleached Sulphite (Domestic and Foreign)— | | | |
| Prime Bleached Sulphite | 2.50 | @ | 3.00 |
| Prime Qualities—Easy-Bleaching Sulphite | 2.20 | " | 2.35 |
| Strong Unbleached Sulphite | 2.10 | " | 2.30 |
| (On Dock, Atlantic Ports) | | | |
| Kraft Bleached | 2.75 | @ | 3.25 |
| Kraft Light & Strong | 1.65 | " | 1.80 |
| Kraft No. 1 | 1.60 | " | 1.75 |
| (F. o. b. Pulp Mill) | | | |
| Kraft Domestic | 1.60 | " | 2.12½ |
| (Delivered) | | | |
| Soda Bleached | 2.55 | " | — |

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits. Also add extra freight charges and war insurance to all quotations on imported pulp.

## Domestic Rags

### New Rags

(Prices to Mill f. o. b. N. Y.)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New White, No. 1 | 8.00 | @ | 8.25 |
| Silesias No. 1 | 5.25 | " | 5.50 |
| New Unbleached | 8.00 | " | 8.25 |
| Blue Overall | 5.50 | " | 5.75 |
| Fancy | 2.50 | " | 3.00 |
| Washables | 2.15 | " | 2.25 |
| Mixed Khaki Cuttings | 2.75 | " | 3.00 |
| O. D. Khaki Cuttings | 3.00 | " | 3.25 |

### Old Rags

| | | | |
|---|---|---|---|
| White, No. 1— | | | |
| Repacked | 3.50 | " | 4.00 |
| Miscellaneous | 3.00 | " | 3.25 |
| White, No. 2— | | | |
| Repacked | 1.25 | " | 2.75 |
| Miscellaneous | 1.75 | " | 1.90 |
| Thirds and Blues— | | | |
| Repacked | 2.00 | " | 2.25 |
| Miscellaneous | 1.75 | " | 1.90 |
| Roofing Rags— | | | |
| No. 1 | 1.70 | " | 1.80 |
| No. 2 | 1.35 | " | 1.40 |
| No. 3 (bagging) | 1.50 | " | 1.60 |
| No. 4 | .60 | " | .65 |
| No. 5A | .60 | " | .65 |

## Foreign Rags

All prices nominal.

### New Rags

| | | | |
|---|---|---|---|
| New Dark Cuttings | 2.25 | @ | 2.40 |
| New Mixed Cuttings | 2.00 | " | 2.20 |
| New Light Silesias | 5.50 | " | 5.75 |
| Light Flannelettes | 5.50 | " | 5.75 |
| New White Cuttings | 7.00 | " | 7.50 |
| New Light Oxford | 4.00 | " | 4.50 |
| New Light Prints | 3.00 | " | 3.25 |

### Old Rags

| | | | |
|---|---|---|---|
| No. 1 White Linens | 7.50 | " | 8.50 |
| No. 2 White Linens | 6.50 | " | 7.50 |
| No. 3 White Linens | 4.50 | " | — |

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| | | | |
|---|---|---|---|
| No. 4 White Linens | 2.25 | @ | 3.25 |
| No. 1 White Cotton | 4.25 | " | 4.75 |
| No. 2 White Cotton | 3.25 | " | 3.75 |
| No. 3 White Cotton | 2.50 | " | 3.00 |
| No. 4 White Cotton | 1.90 | " | 2.20 |
| Extra Light Prints | 2.00 | " | 2.40 |
| Ord. Light Prints | 1.75 | " | 2.15 |
| Med. Light Prints | 1.55 | " | 1.95 |
| Dutch Blue Cottons | 2.25 | " | 2.50 |
| French Blue Linens | 3.00 | " | — |
| Checks and Blues | 2.00 | " | — |
| Linsey Garments | 1.90 | " | 2.00 |
| Dark Cottons | 1.50 | " | 1.60 |
| Old Shopperies | 1.30 | " | 1.45 |
| New Shopperies | 1.45 | " | 1.50 |
| French Blues | 2.25 | " | 2.50 |

### Old Rope and Bagging

(Prices to Mill, f. o. b. N. Y.)

| | | | |
|---|---|---|---|
| Gunny No. 1— | | | |
| Foreign | 2.50 | @ | 2.75 |
| Domestic | 2.25 | " | 2.50 |
| Wool Tares, light | 1.75 | " | 2.00 |
| Wool Tares, heavy | 1.80 | " | 1.90 |
| Bright Bagging | 2.25 | " | 2.50 |
| Manila Rope— | | | |
| Foreign | 3.75 | " | 4.00 |
| Domestic | 3.75 | " | 4.00 |
| Jute Threads | 3.00 | " | 3.25 |
| Sisal Strings | 1.50 | " | 1.60 |
| Mixed Strings | .55 | " | .60 |

### Old Waste Papers

(F. o. b. New York)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| White Envelope Cuttings | 2.75 | @ | 3.00 |
| Ordinary Hard White No. 1 | 2.25 | @ | 2.50 |
| Soft White No. 1 | 1.70 | " | 1.80 |
| Soft White Extra | 2.25 | " | 2.40 |
| Flat Stock— | | | |
| Stitchless | 1.10 | " | 1.25 |
| Overissue Mag | 1.00 | " | 1.10 |
| Solid Flat Book | .90 | " | 1.00 |
| Crumbled No. 1 | .40 | " | .45 |
| Ledger White Stock | 1.55 | " | 1.65 |
| Ledger Stock Colored | 1.05 | " | 1.15 |
| Manila— | | | |
| New Env. Cut | 1.70 | " | 1.80 |
| New Cuttings | 1.40 | " | 1.50 |
| Old Kraft Machine— | | | |
| Compressed bales | 1.00 | " | 1.10 |
| News— | | | |
| No. 1 White News | 1.75 | " | 1.90 |
| Strictly Overissue | .70 | " | .75 |
| Strictly Folded | .55 | " | .60 |
| Corrugated | .60 | " | .65 |
| No. 1 Mixed Paper | .52½ | " | .55 |

### Twines

(F. o. b. Mill)

(Soft Fiber)

| | | | |
|---|---|---|---|
| Coarse Polished— | | | |
| India | .18½ | @ | — |
| White Hemp | .18½ | " | — |
| Fine Polished— | | | |
| Fine India | .23 | " | — |
| Unpolished— | | | |
| Box | .14¾ | " | — |
| Paper Makers | .15 | " | — |
| Tube Rope | .16¼ | " | — |
| Wall Paper | .15¾ | " | — |
| Wrapping | .18 | " | — |
| Soft Fiber Rope | .16¼ | " | — |
| Cotton | .21 | " | — |

(Hard Fiber)

| | | | |
|---|---|---|---|
| Medium Java | .19 | " | — |
| Mex. Sisal | .16 | " | — |
| Manila | .24 | " | — |

## PHILADELPHIA

### Domestic Rags (New)

(Price to Mill, f. o. b. Phil.)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New White No. 1 | .07¼ | @ | .07½ |
| New White, No. 2 | .04 | " | .04½ |
| Light Silesias | — | " | .04½ |
| Silesias, No. 1 | — | " | .04½ |
| Black Silesias, soft | — | " | .03¾ |
| New Unbleached | .05½ | " | .06 |
| Washable, No. 1 | — | " | .04 |
| Blue Overall | — | " | .05 |
| Cottons—According to grades— | | | |
| Washable No. 2 | — | " | .02 |
| New Blue | — | " | .02 |
| Fancy Percales | — | " | .03 |
| New Black Soft | — | " | .04 |
| New Light Seconds | .04½ | " | .05 |
| New Dark Seconds | — | " | 1.50 |
| Khaki Cuttings— | | | |
| No. 1 O. D. | .03½ | " | .04 |
| No. 2 Mixed | .03 | " | .03¼ |
| Corduroy | — | " | .02½ |
| New Canvas | .05½ | " | .06 |
| New Black Mixed | — | " | .03 |

### Domestic Rags (Old)

| | | | |
|---|---|---|---|
| White No. 1— | | | |
| Repacked | 3.50 | @ | 4.00 |
| Miscellaneous | 2.75 | " | 3.00 |
| Thirds and Blues— | | | |
| Miscellaneous | 2.00 | " | 2.25 |
| Repacked | 2.50 | " | 2.75 |
| Black Stockings (Export) | 3.50 | " | 4.00 |
| Roofing Stock— | | | |
| Foreign No. 1 | Nominal | | |
| Domestic No. 1 | 1.50 | " | 1.60 |
| Domestic No. 2 | 1.35 | " | 1.45 |
| Roofing Bagging | — | " | 1.30 |

### Bagging

(F. o. b. Phila.)

| | | | |
|---|---|---|---|
| Gunny, No. 1— | | | |
| Foreign | Nominal | | |
| Domestic | 2.50 | @ | 3.00 |
| Manila Rope | — | " | 4.50 |
| Sisal Rope | 1.75 | " | 2.00 |
| Mixed Rope | 1.25 | " | 1.50 |
| Scrap— | | | |
| No. 1 | 2.25 | " | 2.50 |
| No. 2 | — | " | 1.40 |
| Wool Tares, heavy | 3.50 | " | 3.70 |
| Mixed Strings | .75 | " | 1.00 |
| No. 1 New Light Burlap | 3.00 | " | 3.50 |
| New Burlap Cuttings | 2.00 | " | 2.25 |

### Old Papers

(F. o. b. Phila.)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 Hard White | 2.25 | @ | 2.30 |
| No. 2 Hard White | 2.00 | " | 2.10 |
| No. 1 Soft White | 1.75 | " | 1.80 |
| No. 2 Soft White | 1.40 | " | 1.50 |
| No. 1 Mixed | .90 | " | 1.00 |
| Solid Ledger Stock | 1.50 | " | 1.60 |
| Ledger Stock, white | 1.30 | " | 1.35 |
| Ledger Stock, colored | 1.00 | " | 1.10 |
| No. 1 Books, heavy | .80 | " | .90 |
| Manila Cuttings | 1.90 | " | 2.00 |
| Print Manila | .70 | " | .75 |
| Container Manila | .65 | " | .70 |
| Kraft Paper | 1.00 | " | 1.10 |
| No. 1 Mixed Paper | .55 | " | — |
| Straw Board Chip | .50 | " | — |
| Binders Board Chip | .50 | " | — |
| Corrugated Board | .60 | " | .65 |
| Overissue News | .70 | " | .75 |
| Old Newspapers | .65 | " | .70 |

## BOSTON

### Old Papers

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 Hard White | 2.25 | @ | 2.50 |
| No. 1 Soft White | 1.85 | " | 2.15 |
| No. 2 Mixed | .75 | " | .80 |
| Solid Ledger Books | 1.30 | " | — |
| Overisue Ledger Stock | 1.30 | " | 1.50 |
| Mixed Ledgers | .85 | " | .90 |
| No. 1 Books, heavy | 1.00 | " | 1.10 |
| No. 1 Books, light | .65 | " | .75 |
| Crumpled Stitchless Book Stock | .55 | " | .65 |
| Manila Env. Cuttings | 1.70 | " | 1.85 |
| Manila Envelope Cuttings, extra quality | 2.35 | " | 2.60 |
| Corrugated Boxes | .55 | " | .65 |
| White Blank News | 1.30 | @ | 1.40 |
| No. 1 Kraft | 1.10 | " | 1.20 |
| Mixed Papers | .52½ | " | .55 |
| Print Manila | .70 | " | .75 |
| Container Manila | .60 | " | .70 |
| Old Newspapers | .60 | " | .65 |
| Paper Wool Strings | .80 | " | .90 |
| Overissue News | .70 | " | .75 |
| Box Board Chips | .52½ | " | .55 |
| Corrugated Boxes | .57½ | " | .62½ |
| Kraft corrugated boxes | 1.10 | " | 1.20 |
| Screening Wrappers | .60 | " | .70 |

### Bagging

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Manila Rope— | | | |
| Foreign | 4.25 | @ | 4.50 |
| Domestic | 4.00 | @ | 4.50 |
| Sisal Rope | 2.25 | " | 2.50 |
| Mixed Rope | 1.00 | " | 1.10 |
| Transmission Rope | 3.00 | " | — |
| Soft Jute Rope | 2.60 | " | 2.85 |
| Jute Carpet Threads | 1.25 | " | 1.50 |
| Gunny Bagging— | | | |
| Foreign | 2.50 | " | — |
| Domestic | 2.10 | " | 2.25 |
| Bleachery Burlap | 3.00 | " | 3.50 |
| Scrap Burlap— | | | |
| Foreign | 2.25 | " | 2.30 |
| Domestic | 1.85 | " | 1.90 |
| Scrap Sisal | 2.25 | " | 2.35 |
| Scrap Sisal for Shredding | 2.50 | " | 2.60 |
| Wool Tares, Heavy | 2.40 | " | 2.50 |
| New Burlap Cuttings | 2.35 | " | 2.50 |
| Aust. Wool Pouches | 3.00 | " | 3.25 |
| Heavy baling bagging | 2.25 | " | 2.75 |
| Paper Mill Bagging | 1.25 | " | 1.50 |
| No. 2 Bagging | 1.10 | " | 1.25 |

### Domestic Rags (New)

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New Light Prints | .03¼ | @ | .03½ |
| New White No. 1 | .07 | " | .07¼ |
| New Light Flannelettes | .05 | " | — |
| Silesias No. 1 | .04 | " | .04¼ |
| New Black Silesias | .03½ | " | .03¾ |
| Soft Unbleached | 7.50 | " | 8.00 |
| Blue Cheviots | .05½ | " | .06 |
| Fancy | .02 | " | .02½ |
| Washable | .02 | " | .02½ |
| Cottons—According to grades— | | | |
| Blue Overalls | .05¼ | " | .05½ |
| New Black, soft | .03¼ | @ | .04 |
| Khaki Cuttings | .02½ | " | .03 |
| O. D. Khaki | .03 | " | .03¼ |
| Corduroy | .02¾ | " | .03 |
| New Canvas | .06¾ | " | .07¼ |
| B. V. D. Cuttings | .07 | " | .07½ |

### Domestic Rags (Old)

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Canvas | .04¼ | @ | — |
| White No. 1— | | | |
| Repacked | — | " | 2.75 |
| Miscellaneous | 2.50 | " | 2.75 |
| White No. 2— | | | |
| Repacked | 1.90 | " | 2.00 |
| Miscellaneous | 2.00 | " | 2.25 |
| Twos and Blues | 2.25 | " | 2.50 |
| Old Blue Overalls | 1.60 | " | 2.00 |
| Thirds and Blues— | | | |
| Repacked | 2.00 | " | 2.25 |
| Miscellaneous | 1.50 | " | 1.60 |
| Black Stockings | 4.00 | " | 4.25 |
| Roofing Stock— | | | |
| No. 1 | 1.75 | " | 2.00 |
| No. 2 | 1.60 | " | 1.65 |
| No. 3 | 1.00 | " | 1.25 |

### Foreign Rags

(F. o. b. Boston)

| | |
|---|---|
| Dark Cottons | (nominal) |
| Dutch Blues | (nominal) |
| New Checks and Blues | (nominal) |
| Old Fustians | (nominal) |
| Old Linsey Garments | (nominal) |
| New Silesias | (nominal) |

## TORONTO

### Paper

### Bonds

Direct mill shipment in two-ton lots.

| | | | |
|---|---|---|---|
| No. 1 White | $35.50 | @ | — |
| No. 1 Tints | 36.50 | " | — |
| No. 2 White | 25.50 | " | — |
| No. 2 Tints | 26.50 | " | — |
| No. 2 Golden Rod | 27.50 | " | — |
| No. 3 White | 21.00 | " | — |
| No. 4 White | 15.00 | " | — |
| No. 4 Tints | 16.00 | " | — |
| No. 4 Golden Rod | 17.00 | " | — |

Direct mill shipment in three-ton lots.

| | | | |
|---|---|---|---|
| No. 5 White | $10.50 | @ | — |
| No. 5 Tints | 11.50 | " | — |
| No. 5 Golden Rod | 12.00 | " | — |
| No. 6 White | 9.00 | " | — |
| No. 6 Tints | 9.50 | " | — |
| No. 6 Golden Rod | 11.00 | " | — |
| No. 7 White | 8.00 | " | — |
| No. 7 Tints | 8.50 | " | — |
| No. 7 Golden Rod | 10.00 | " | — |

Book—

| | | | |
|---|---|---|---|
| No. 1 M. F. | $7.00 | " | — |
| No. 2 M. F. | 6.50 | " | — |
| No. 3 M. F. | 5.35 | " | — |
| No. 1 S. C. | 7.25 | " | — |
| No. 2 S. C. | 6.75 | " | — |
| No. 3 S. C. | 5.85 | " | — |

### Coated Book & Litho

Ton Lots (resale)

| | | | |
|---|---|---|---|
| No. 1 | $12.00 | @ | — |
| No. 2 | 10.25 | " | — |
| No. 3 | 8.90 | " | — |
| Coated tinted | 13.00 | " | — |
| Wrapping—delivered— | | | |
| Rag Brown | 4.85 | " | 5.25 |
| White Wrap | 4.00 | " | — |
| "B" Manila | 4.90 | " | 6.15 |
| No. 1 Manila | $5.50 | @ | $6.90 |
| Fiber | 5.50 | " | 6.90 |
| Kraft No. 2 | 5.50 | " | 6.90 |

(F. o. b. Cars, Toronto)

| | | | |
|---|---|---|---|
| News per ton— | | | |
| Rolls (contract) | 46.00 | " | — |
| Sheets | 54.00 | " | — |

### Pulp

| | | | |
|---|---|---|---|
| Ground wood | $33.00 | @ | 36.00 |
| Unbleached sulphite | 44.00 | " | — |
| Bleached sulphite | 54.00 | " | — |
| Kraft | 50.00 | " | — |
| Soda | 54.00 | " | — |

### Old Waste Paper

(In carload lots, f. o. b. Toronto)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| White Env. Cut | 2.00 | @ | — |
| Soft White | 1.75 | " | 2.00 |
| White Blk. News | 1.25 | " | 1.35 |
| Book and Ledger— | | | |
| Flat Magazine and Book Stock (old) | .90 | " | 1.00 |
| Light and Crumpled Book Stock | .80 | " | .90 |
| Ledgers and Writings | 1.15 | " | — |
| Manilas— | | | |
| New Manila Cut | 1.45 | " | — |
| Printed Manilas | .55 | " | .60 |
| Kraft | 1.10 | " | — |
| News and Scrap— | | | |
| Strictly Overissue | .65 | " | — |
| Strictly Folded | .60 | " | — |
| No. 1 Mixed Paper | .50 | " | — |

## Newsprint Subject to Permit

WASHINGTON, D. C., November 15—The Danish Government has again made the importation of newsprint paper subject to import permit, according to a cablegram from the Office of the American Commercial Attache, Copenhagen. It is understood that the rapidly decreasing foreign exchange supply is the principal reason for this action.

## Filter Paper on License List

WASHINGTON, D. C., November 15—The list of additional products for which licenses for export and re-export from Denmark are required has now been received by the department of commerce. Among other items, this list now includes filter paper.